
Mississippi Wetland Management District

including:

**Dahomey NWR and
Tallahatchie NWR**

**Annual Narrative
Grenada, Mississippi**

**Calendar Year
1999**

Refuge Manager Date

District Manager Date

Geographic Assistant Date
Regional Director



Photo 1. Shorebirds at the Black Bayou Unit of Tallahatchie NWR. Due to moist soil management activities implemented by the MWMD, shorebird numbers have increased dramatically (four-fold) at the Black Bayou Unit during the past three years. Photo by Fred Broerman.

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INTRODUCTION

The Mississippi Wetland Management District Complex (MWMD) was established in Grenada, Mississippi in 1989, primarily to manage the increased land base being acquired through the transfer of properties to the U.S. Fish and Wildlife Service (Service) by the Farmers Home Administration (FmHA), now the Farm Services Administration, and the acquisition of **Dahomey and Tallahatchie National Wildlife Refuges** (NWR). At that time, there were no other stations in an appropriate geographical location to manage these lands. After several management decisions and boundary changes, MWMD's final geographical boundaries contained 26 counties in northern Mississippi (Figure 1).

FmHA Lands are properties in which the United States Department of Agriculture (USDA) foreclosed on, or the owner voluntarily deeded his land back to the USDA due to lack of payment on loans (Photos 2 and 3). Original owners were given the right to buy their land, but Executive Order 11990 required the wetlands on these properties to be set aside or protected. Most of the properties that the original owners did not buy back was transferred fee title to the Service to manage. Properties that were repurchased by the original owner are subject to restrictive USDA easements. Easement management responsibilities of these properties were transferred to the Service and are considered as units of the NWR System. **FmHA Lands** range from 1 acre to over 1,000 acres in size and are categorized as follows:

- 1) **Fee Title Properties:** These properties are now considered public land and are managed as units of the NWR System.
- 2) **Conservation Easements:** The ownership of these properties remains in the private sector, but the Service retains most management rights. For example, these lands are no longer farmed, and the Service is allowed to mow, install water control structures, build levees, burn, plant seedlings or acorns, and manage water levels.
- 3) **Floodplain Easements:** The least restrictive of the two easements, the ownership remains in the private sector with restrictions which prohibit degradation of existing flood plain values. The land owner is usually allowed to farm acreage that was previously in cultivation, but the easement restricts further draining or clearing of the land. These easements often contain, smaller, more restrictive conservation easements within their boundaries.

In 1989, there were four recorded easements for a total land base of 1,070 acres. As of 1999 MWMD manages two traditional NWR totaling 15,842 fee acres, 48 **FmHA Fee Title** transfers totaling 10,673 acres, 57 **Conservation Easements** totaling 4,343 acres, and 21 **Floodplain Easements** totaling 2,166 acres (Figure 2 and Table 1). The MWMD now manages 126 FmHA tracts and two NWR totaling 33,024 acres.

Fifteen Mississippi Counties with FmHA Properties
Managed by U.S. Fish and Wildlife Service
Mississippi Wetland Management District (MWMD)

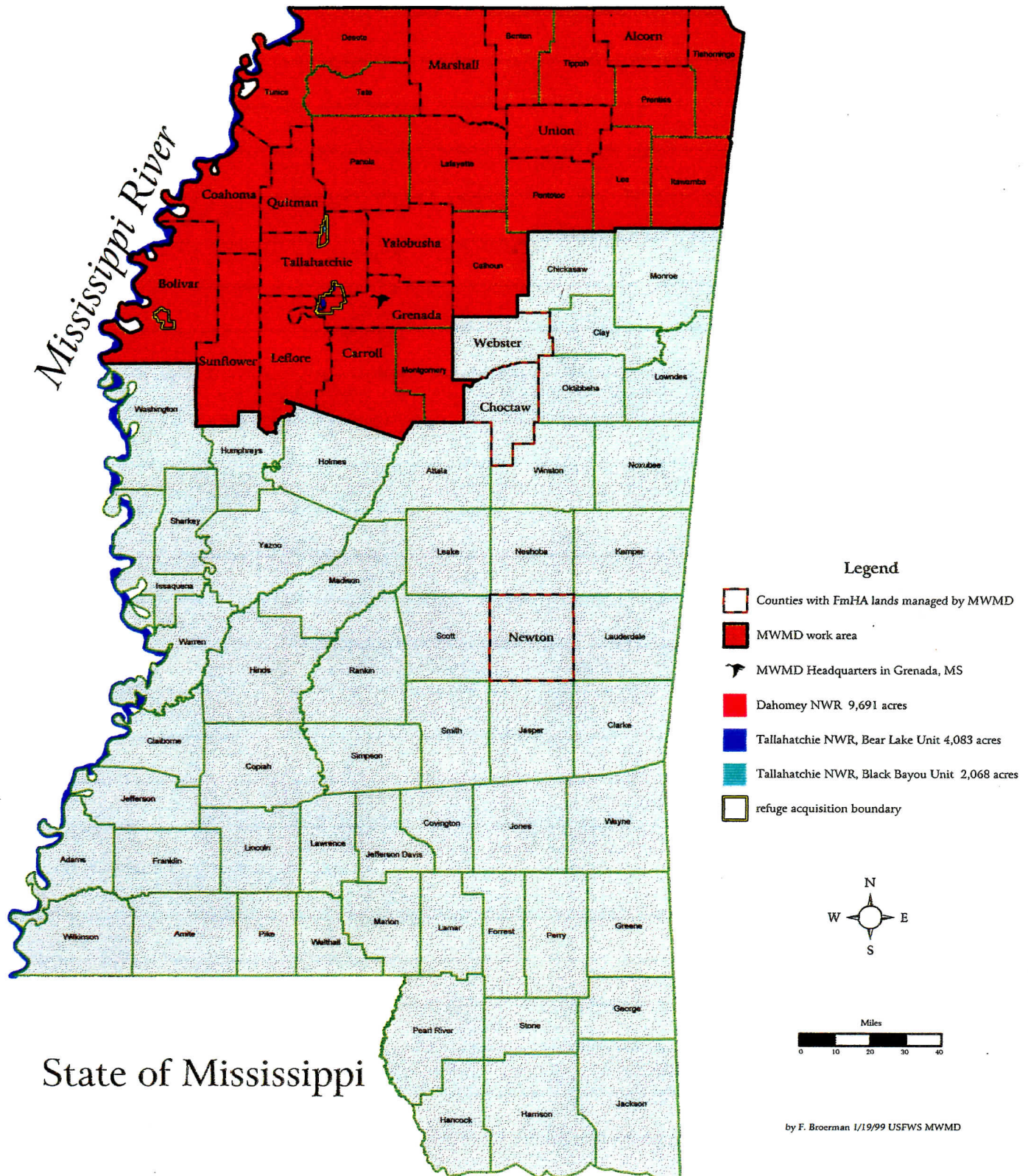


Figure 1. MWMD manages FmHA Properties in fifteen Mississippi Counties.

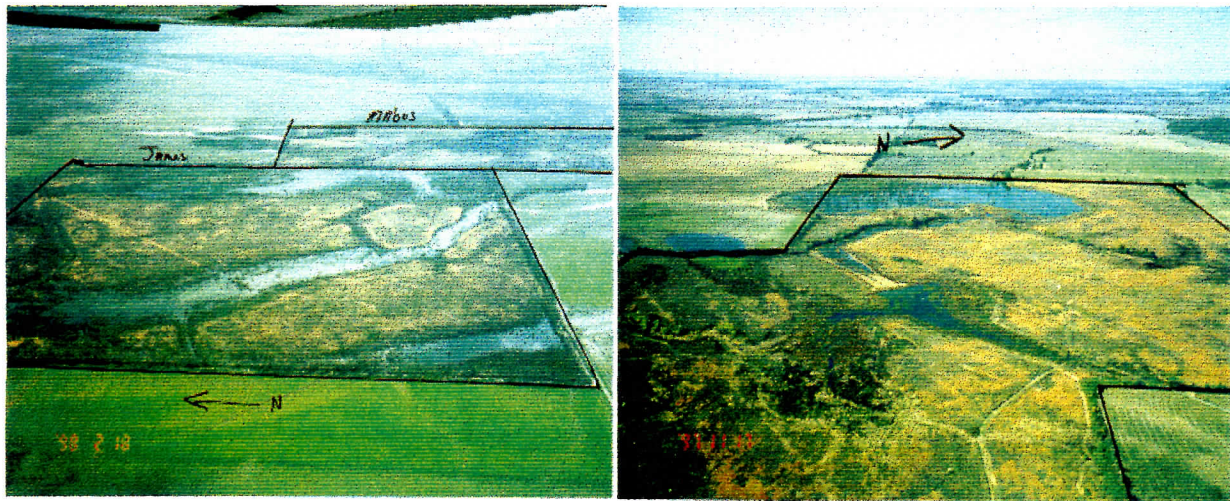
Table 1. Properties managed by Mississippi Wetlands Management District.

REFUGE PROPERTIES								
NAME	COUNTY	ACRES	ESTATE	15' QUAD	7.5' QUAD	LEGAL DESCRIPTION	YEAR ACQUIRED	LAT/LON
DAHOMNEY NWR								
Allen Gray Estate/TNC	BOLIVAR	9,269	Fee Title	CHOCTAW, PACE	BEULAH, LOBDELL	T22N R7W SEC. 17, 19, 22 & 27-34; T21N R7W SEC. 1-4 & 9-12	1993	33°42'N 90°55'W
MS Dept of Trans. (DOT)	BOLIVAR	162	Fee Title	CHOCTAW	LOBDELL	T22N R7W SEC. 34	1991	33°42'N 90°54'W
West Boliver Co. School Board	BOLIVAR	260	Lease	CHOCTAW, PACE	BEULAH, LOBDELL	T22N R7W SEC. 16	N/A	33°45'N 90°09'W
DAHOMNEY NWR	TOTAL ACRES		9,691					
BEAR LAKE UNIT, TALLAHATCHIE NWR								
Walker Tract	TALLAHATCHIE	557	Fee Title	PHILIPP	CASCILLA	T23N R2E SEC. 21, 22 & 28	1991	30°50'N 90°05'W
John Whitten	GRENADA, TALLAHATCHIE	509	Fee Title	PHILIPP	PHILIPP	T22N R1E SEC.13 & 24; T22N R2E SEC. 18	1992	33°45'N 90°08'W
John Hancock	GRENADA, TALLAHATCHIE	1,361	Fee Title	PHILIPP	PHILIPP	T22N R1E SEC. 1, 12 & 13; T22N R2E SEC. 7 & 18	1992	33°47'N 90°08'W
Chicago Mills/DOT	TALLAHATCHIE	1,656	Fee Title	GREENWOOD, PHILIPP	MONEY, PHILIPP	T22N R1E SEC. 14, 22-27 & 34	1997	33°45'N 90°09'W
BEAR LAKE UNIT, TALLAHATCHIE NWR	TOTAL ACRES (Fee Title only)		4,083					
BLACK BAYOU UNIT, TALLAHATCHIE NWR								
Travelers Insurance	QUITMAN, TALLAHATCHIE	1,730	Fee Title	CROWDER	FISH HOOK LAKE	T26N R2E SEC. 30 & 31; T26N R1E SEC. 25 & 36	1991	34°5'N 90°08'W
Shiele Tract	TALLAHATCHIE	40	Fee Title	CROWDER	CROWDER	T26N R2E SEC. 7	1996	34°8'N 90°08'W
Duck Ponds Inc.	QUITMAN, TALLAHATCHIE	298	Fee Title	CROWDER	FISH HOOK LAKE	T26N R2E SEC. 19; T26N R1E SEC. 24	1996	34°6'N 90°08'W
BLACK BAYOU UNIT, TALLAHATCHIE NWR	TOTAL ACRES		2,069					
FmHA FEE TITLE PROPERTIES								
NAME	COUNTY	ACRES	Tract #	15' QUAD	7.5' QUAD	LEGAL DESCRIPTION	DATE ACQUIRED	LAT/LON
CARMICL	BOLIVAR	40	14	PACE	SHELBY	T24N R6W SEC. 26	07/26/91	33°54'N 90°47'W
GOSS	BOLIVAR	543	17	MELLWOOD	ROUND LAKE	T26N R5W SEC. 35 & 36; T25N R5W SEC. 2	07/14/94	34°05'N 90°47'W
HESTER, T. III	BOLIVAR	389	13	PACE	PACE	T23N R6W SEC. 1	07/26/91	33°52'N 90°46'W
HOLCOMB, D.	BOLIVAR	40	12	CLARKSDALE	DUNCAN	T25N R5W SEC. 13	07/26/91	34°02'N 90°40'W
RAY	BOLIVAR	50	18	PACE	SHELBY	T25N R6W SEC. 33	09/27/94	33°59'N 90°49'W
RILEY	BOLIVAR	100	11	MOUND BAYOU	MERIGOLD	T23N R5W SEC. 13	07/26/91	33°50'N 90°40'W
WATTS, J.	BOLIVAR	214	16	MELLWOOD	ROUND LAKE	T25N R6W SEC. 4	07/31/92	34°04'N 90°50'W
WATTS, J.	BOLIVAR	81	16	MELLWOOD	ROUND LAKE	T26N R6W SEC. 33	07/31/92	34°04'N 90°49'W
GILLON	GRENADA	245	11	GRENADA	GRENADA	T22N R5E SEC. 21	07/14/93	34°04'N 90°49'W
GWIN	LEFLORE	343	16	SUMNER	GLENDORA	T22N R2W SEC. 13 & 24	02/19/92	33°45'N 90°21'W
HENSON	LEFLORE	165	19	MOSSY LAKE	MONTGOMERY	T17N R1W SEC. 19	07/15/92	33°19'N 90°20'W
HENSON / A.C.O.E.	LEFLORE	275	no	MOSSY LAKE	MONTGOMERY	T17N R1W SEC. 19	?	33°19'N 90°20'W
KIMBROUGH, A.M.	LEFLORE	40	18	MOSSY LAKE	MONTGOMERY	T17N R1W SEC. 18	04/18/92	33°19'N 90°20'W
MILLICAN, H.	LEFLORE	2	17	SEVEN PINE	SIDON	T18N R1E SEC. 30	03/05/92	33°23'N 90°14'W
MILLICAN, H.	LEFLORE	76	17	SEVEN PINE	SIDON	T18N R1E SEC. 31	03/05/92	33°23'N 90°14'W
ROBERTSON	LEFLORE	655	14	GREENWOOD	GREENWOOD	T20N R1E SEC. 24 & 25	10/02/90	33°34'N 90°08'W
SCOTT	LEFLORE	226	20	SUMNER	BROOKS	T22N R2W SEC. 8	09/01/94	33°47'N 90°25'W
SCOTT	LEFLORE	80	20	SUMNER	BROOKS	T22N R2W SEC. 3	09/01/94	33°48'N 90°23'W
SCOTT	LEFLORE	90	20	SUMNER	BROOKS	T22N R2W SEC. 9	09/01/94	33°47'N 90°24'W
SMITH, E.	MARSHALL	232	10	POTTS CAMP	MALONE	T6S R2W SEC. 28 & 29		34°37'N 89°25'W
WHALEY	MARSHALL	437	11	POTTS CAMP	BETHLEHEM	T6S R1W SEC. 6 & 7; T6S R2W SEC.1		34°35'N 89°21'W
BUTLER	QUITMAN	245		TUTWILER	LAMBERT	T27N R1W SEC. 11, 12 & 14	04/01/99	34°13'N 90°15'W
SAVAGE, E.	QUITMAN	59	10	TUTWILER	LAMBERT	T27N R1W SEC. 11	11/06/90	34°13'N 90°16'W
SAVAGE, P.	QUITMAN	40	13	CROWDER	CROWDER	T26N R1E SEC. 1	09/01/93	34°08'N 90°08'W
SAVAGE, P.	QUITMAN	20	13	CROWDER	CROWDER	T26N R1E SEC. 12	09/01/93	34°07'N 90°08'W
STARR, R.	QUITMAN	750	12	SLEDGE	GREENSHAW SOUTH	T8S R10W SEC. 1 & 2	06/02/91	34°25'N 90°13'W
STARR, R.	QUITMAN	320	12	SLEDGE	GREENSHAW SOUTH	T7S R10W SEC. 23	06/02/91	34°27'N 90°13'W
TRAINOR / BOYD	QUITMAN	382	11	TUTWILER	LAMBERT	T26N R1W SEC. 2 & 11	11/06/90	34°09'N 90°15'W
TRAINOR / BOYD	QUITMAN	219	11	CROWDER	CROWDER	T27N R1E SEC. 19& 20	11/06/90	34°12'N 90°14'W
TRAINOR / BOYD	QUITMAN	188	11	CROWDER	CROWDER	T27N R1E SEC. 20, 21 & 29	11/06/90	34°11'N 90°12'W
TRAINOR / BOYD	QUITMAN	217	11	TUTWILER	LAMBERT	T27N R1W SEC. 27	11/06/90	34°10'N 90°07'W
BOWLING	SUNFLOWER	170	14	BAIRD	MOOREHEAD	T19N R3W SEC. 29	12/06/91	33°29'N 90°31'W
LINDSEY, L.	SUNFLOWER	160	13	CLEVELAND	BOYER	T20N R4W SEC. 17	07/26/91	33°34'N 90°38'W
LINDSEY, L.	SUNFLOWER	40	13	CLEVELAND	RULEVILLE	T21N R4W SEC. 14	07/26/91	33°40'N 90°35'W
LINDSEY, L.	SUNFLOWER	204	13	CLEVELAND	RULEVILLE	T22N R4W SEC. 3	07/26/91	33°42'N 90°35'W
POVALL / KITCHENS	SUNFLOWER	180	11	BAIRD	MOOREHEAD	T19N R4W SEC. 25	11/06/90	33°27'N 90°33'W
POVALL / KITCHENS	SUNFLOWER	422	11	BAIRD	INVERNESS	T17N R4W SEC. 24 & 25	11/06/90	33°18'N 90°33'W
POVALL / KITCHENS	SUNFLOWER	80	11	BAIRD	INVERNESS	T17N R4W SEC. 13 & 18	11/06/90	33°19'N 90°33'W
WALKER	SUNFLOWER	42	10	CLEVELAND	CLEVELAND	T21N R4W SEC. 29	10/02/90	33°38'N 90°38'W
PATTERSON / WHITTEN	SUNFLOWER	46	15	SUMNER	ROME	T24N R3W SEC. 15 & 22	09/01/94	33°56'N 90°29'W
WILKINS	SUNFLOWER	1,204	12	SUMNER	ROME	T24N R3W SEC. 35 & 36; T23N R3W SEC. 1	05/02/91	33°54'N 90°22'W
CASTLEBERRY	TALLAHATCHIE	94	12	CROWDER	CROWDER	T26N R2E SEC. 7	11/01/93	34°07'N 90°07'W
JAMES	TALLAHATCHIE	160	10	PHILLIP	TIPPO	T24N R1E SEC. 36	10/11/90	33°54'N 90°08'W
PENNINGTON	TALLAHATCHIE	470	17	SUMNER	WEBB	T25N R2W SEC.36		33°59'N 90°21'W
PENNINGTON	TALLAHATCHIE	360	17	TUTWILER	VANCE	T25N R2W SEC. 26		34°00'N 90°22'W
PENNINGTON	TALLAHATCHIE	40	17	TUTWILER	VANCE	T25N R1W SEC. 2		34°03'N 90°15'W
FOOSHIE / SMITH	UNION	104	10	NEW ALBANY	NEW ALBANY WEST	T7S R2E SEC. 32 & 33	07/22/94	34°26'N 89°06'W
FOOSHIE / SMITH	UNION	134	10	NEW ALBANY	ETTA, NEW ALBANY WEST	T7S R2E SEC. 31 & 32	07/22/94	34°26'N 89°07'W
48 FEE TITLE PROPERTIES IN 8 COUNTIES		10,573 ACRES						

Table 1. Properties managed by Mississippi Wetlands Management District.

FEMA CONSERVATION EASEMENTS								
NAME	COUNTY	ACRES	Tract #	15' QUAD	7.5' QUAD	LEGAL DESCRIPTION	DATE ACQUIRED	LAT/LON
BELL / CRAB	ALCORN	40	10C	WALNUT	CHALYBEATE	T2S R5E SEC. 29	11/25/91	34°53'N 88°47'W
TURNER / TALLEY	ALCORN	8	11C	CORINTH	KUSSUTH NORTH	T1S R6E SEC. 35	02/22/95	34°57'N 88°37'W
BALDUCCI	BOLIVAR	12	19C	MOUND BAYOU	MOUND BAYOU	T24N R5W SEC. 6	10/13/95	33°58'N 90°45'W
BALDUCCI	BOLIVAR	12	19C	PACE	SHELBY	T24N R6W SEC. 1	10/13/95	33°54'N 90°46'W
BASS, B.H.	BOLIVAR	69	15C	PACE	SHELBY	T25N R6W SEC. 33	04/21/92	33°59'N 90°49'W
BASS, B.H.	BOLIVAR	277	15C	MELLWOOD	LACONIA, ROUND LAKE & SHELBY	T25N R7W SEC. 25 & 36	04/21/92	34°00'N 90°52'W
BASS, B.H.	BOLIVAR	723	15C	MELLWOOD	LACONIA & ROUND LAKE	T25N R7W SEC. 23 & 24	04/21/92	34°01'N 90°52'W
CLIFTON, R.	BOLIVAR	97	10C	CHOCTAW	LOBDELL	T21N R7W SEC. 28	12/18/89	33°08'N 90°55'W
HESTER, T. JR.	BOLIVAR	55		PACE	SHELBY	T25N R6W SEC. 34		33°59'N 90°48'W
HESTER, T. JR.	BOLIVAR	35		PACE	SHELBY	T25N R6W SEC. 34		33°59'N 90°48'W
McCLURE, J.	BOLIVAR	40		CLEVELAND	CLEVELAND	T21N R4W SEC. 26		33°47'N 90°43'W
McCLURE, J.	BOLIVAR	40		CLEVELAND	CLEVELAND	T21N R5W SEC. 33		33°38'N 90°41'W
CALHOUN / DANCE	CARROLL	149	10C	COILA	PEACHAHALA CREEK	T17N R5E SEC. 31 & 32		33°17'N 89°47'W
CALHOUN / DANCE	CARROLL	57	10C	COILA	PEACHAHALA CREEK	T16N R5E SEC. 6		33°16'N 89°49'W
CALHOUN / DANCE	CARROLL	16	10C	COILA	PEACHAHALA CREEK	T17N R5E SEC. 31		33°17'N 89°48'W
ALLEN	COAHOMA	4	11C	MARKS	LULA	T30N R3W SEC. 34		34°25'N 90°29'W
ALLEN	COAHOMA	52	11C	MARKS	LULA	T29N R3W SEC. 10 & 15		34°22'N 90°29'W
ALLEN	COAHOMA	31	11C	MARKS	LULA	T29N R3W SEC. 10 & 11		34°23'N 90°29'W
ALLEN	COAHOMA	30	11C	MARKS, FARRELL	LULA	T29N R3W SEC. 15		34°22'N 90°30'W
SAFLEY / BRADY	COAHOMA	13	10C	MOUND BAYOU	BALTZER	T25N R3W SEC. 32	02/28/90	33°59'N 90°31'W
STATEN	GRENADA	74	12C	PHILIPP	CASCILLA	T22N R2E SEC. 17 & 20		33°45'N 90°06'W
HARRIS, W.L.	GRENADA	18	10C	PHILIPP	CASCILLA	T22N R2E SEC. 10		33°46'N 90°04'W
MOOR, R.B.	LEFLORE	11	15C	GREENWOOD	GREENWOOD	T19N R1W SEC. 12	11/29/90	33°31'N 90°14'W
MOOR, R.B.	LEFLORE	77	15C	GREENWOOD & SCHLATER	GREENWOOD & SHELLMOUND	T19N R1W SEC. 12	11/29/90	33°31'N 90°15'W
MOOR, R.B.	LEFLORE	17	15C	SCHLATER	SHELLMOUND	T19N R1W SEC. 12	11/29/90	33°31'N 90°15'W
MOOR, R.B.	LEFLORE	58	15C	SCHLATER	GREENWOOD & SHELLMOUND	T19N R1W SEC. 13	11/29/90	33°30'N 90°15'W
TRIBBLE	LEFLORE	12		GREENWOOD	MONEY	T21N R1E SEC. 20		33°40'N 90°12'W
TRIBBLE	LEFLORE	28		GREENWOOD	MONEY	T21N R1E SEC. 20		33°40'N 90°13'W
HAWKINS	LEFLORE	33	12C	SCHLATER	BEAR CUT BAYOU	T20N R2W SEC. 34	09/20/80	33°33'N 90°23'W
KOLLE, R	LEFLORE	109	10C	SCHLATER	SHELL MOUND	T20N R2W SEC. 23	05/04/90	33°35'N 90°22'W
UPCHURCH / PRESTRIDGE	LEFLORE	250	11C	SCHLATER	BEAR CUT BAYOU	T20N R2W SEC. 22, 26 & 27	10/01/90	33°34'N 90°23'W
SAUNDERS	LEFLORE	15	13C	MOSSY LAKE & SCHLATER	COLONY TOWN	T19N R2W SEC. 20	07/09/90	33°30'N 90°25'W
SAUNDERS	LEFLORE	45	13C	MOSSY LAKE & SCHLATER	COLONY TOWN	T19N R2W SEC. 20	07/09/90	33°30'N 90°25'W
GRAHAM, T.	NEWTON	38	10C	not available	DECATUR	T8N R12E SEC. 3 & 4	06/08/92	32°23'N 89°03'W
TRAINOR, E. L.	QUITMAN	6	16C	CROWDER	CROWDER	T27N R1W SEC. 12 & 13	01/01/98	34°13'N 90°14'W
POWELL	SUNFLOWER	40	16C	CLEVELAND	RULEVILLE	T22N R6W SEC. 11		33°40'N 90°34'W
DAVIS, HIRAM	TALLAHATCHIE	17	13C	PHILIPP	MONEY	T22N R1E SEC. 29	02/15/90	33°44'N 90°12'W
DENMAN	TALLAHATCHIE	8	14C	PHILIPP	TIPPO	T24N R1E SEC. 5		33°59'N 90°12'W
DENMAN	TALLAHATCHIE	6	14C	PHILIPP	TIPPO	T24N R1E SEC. 5		33°58'N 90°12'W
DENMAN	TALLAHATCHIE	6	14C	PHILIPP	TIPPO	T24N R1E SEC. 5		33°58'N 90°12'W
HARRIS, W.L.	TALLA, GRENA.	389	10C	PHILIPP	CASCILLA	T23N R2E SEC. 35 & 36; T22N R2E SEC. 1	04/28/89	33°48'N 90°03'W
HARRIS, W.L.	TALLAHATCHIE	40	10C	PHILIPP	CASCILLA	T23N R2E SEC. 34	04/28/89	33°48'N 90°04'W
MABUS	TALLAHATCHIE	42	16C	CROWDER	FISH HOOK LAKE	T25N R1E SEC. 26 & 27		34°00'N 90°10'W
MABUS	TALLAHATCHIE	416	16C	PHILLIP	PHILIPP & TIPPO	T24N R1E SEC. 36; T23N R1E SEC. 1 & 12		33°53'N 90°08'W
MABUS	TALLAHATCHIE	7	16C	PHILLIP	PHILIPP	T23N R1E SEC. 21		33°50'N 90°12'W
MACKEY / GASTON, J.	TALLAHATCHIE	81	11C	CROWDER & TUTWILER	CROWDER	T25N R1W SEC. 12	11/02/90	34°02'N 90°14'W
MILAM	TALLAHATCHIE	3		PHILIPP	TIPPO	T24N R1E SEC. 11	10/22/98	33°57'N 90°09'W
MILAM	TALLAHATCHIE	40		PHILIPP	TIPPO	T24N R1E SEC. 12	10/22/98	33°57'N 90°09'W
SHOOK	TALLAHATCHIE	35	15C	PHILIPP	PAYNES	T24N R2E SEC. 17	07/14/95	33°57'N 90°06'W
BENSON	UNION	76		NEW ALBANY	ETTA	T7S R1E SEC. 21	07/01/99	34°27'N 89°12'W
BENSON	UNION	1		NEW ALBANY	ETTA	T7S R1E SEC. 21	07/01/99	34°27'N 89°12'W
BENSON	UNION	2		NEW ALBANY	ETTA	T7S R1E SEC. 20 & 21	07/01/99	34°27'N 89°12'W
BENSON	UNION	26		NEW ALBANY	ETTA	T7S R1E SEC. 17 & 20	07/01/99	34°28'N 89°13'W
BENSON	UNION	6		NEW ALBANY	ETTA	T7S R1E SEC. 17	07/01/99	34°28'N 89°12'W
BENSON	UNION	2		NEW ALBANY	ETTA	T7S R1E SEC. 17	07/01/99	34°28'N 89°12'W
HARRIS, W.L.	WEBBS, CHOC.	515	10C	not available	EUPORA & SAPA	T19N R10E SEC. 9, 10 & 15	04/28/89	33°31'N 89°14'W
HOLLAND / BOONE	YALOBUSHA	37		GRENADA	SCOBEE	T25N R4W SEC. 36		33°59'N 89°49'W
57 CONSERV. EASEMENTS IN 14 COUNTIES		4,343	ACRES					

FEMA FLOODPLAIN EASEMENTS								
NAME	COUNTY	ACRES	Tract #	15' QUAD	7.5' QUAD	LEGAL DESCRIPTION	DATE ACQUIRED	LAT/LON
HESTER, T. JR.	BOLIVAR	4		PACE	SHELBY	T24N R6W SEC. 3		33°59'N 90°48'W
STATEN	GRENADA	190	12C	PHILIPP	CASCILLA	T22N R2E SEC. 17 & 20	07/14/95	33°45'N 90°06'W
KOLLE, R	LEFLORE	191	10C	SCHLATER	SHELL MOUND	T20N R2W SEC. 23	05/04/90	33°53'N 90°22'W
McCLATCHY	MARSHALL	124	12C	TYRO	MARIANNA	T4S R3W SEC. 22		34°43'N 89°30'W
DEARING / GIBSON	NEWTON	8	11C	not available	HERO	T5N R12W SEC. 32	11/13/90	32°14'N 89°05'W
TRAINOR, E. L.	QUITMAN	3		TUTWILER	LAMBERT	T27N R1W SEC. 13 & 14	01/01/98	34°12'N 90°15'W
TRAINOR, E. L.	QUITMAN	16		CROWDER & TUTWILER	CROWDER & LAMBERT	T27N R1W SEC. 13	01/01/98	34°12'N 90°15'W
POWELL	SUNFLOWER	7		CLEVELAND	RULEVILLE	T21N R4W SEC. 14		33°40'N 90°34'W
POWELL	SUNFLOWER	21		CLEVELAND	BOYER & SUNFLOWER	T20N R4W SEC. 32		33°31'N 90°37'W
POWELL	SUNFLOWER	24		CLEVELAND	BOYER	T19N R4W SEC. 5		33°31'N 90°37'W
DAVIS, HIRAM	TALLAHATCHIE	240	13C	PHILIPP	MONEY	T22N R1E SEC. 29		33°44'N 90°13'W
DENMAN	TALLAHATCHIE	77	14C	PHILIPP	TIPPO	T24N R1E SEC. 5		33°58'N 90°12'W
MABUS	TALLAHATCHIE	429	16C	CROWDER	FISH HOOK LAKE	T25N R1E SEC. 25 & 26		34°00'N 90°09'W
MABUS	TALLAHATCHIE	168	16C	PHILIPP	PHILIPP	T23N R1E SEC. 20 & 21		33°50'N 90°12'W
MACKEY / GASTON, J.	TALLAHATCHIE	217	11C	CROWDER & TUTWILER	CROWDER & VANCE	T25N R1W SEC. 12	11/02/90	34°03'N 90°15'W
MILAM	TALLAHATCHIE	160		PHILIPP	TIPPO	T24N R1E SEC. 11 & 12	10/22/98	33°57'N 90°09'W
SHOOK	TALLAHATCHIE	160	15C	PHILIPP	PAYNES	T24N R2E SEC. 17	07/14/95	33°56'N 90°06'W
BENSON	UNION	43		NEW ALBANY	ETTA	T7S R1E SEC. 17	07/01/99	34°28'N 89°12'W
BENSON	UNION	36		NEW ALBANY	ETTA	T7S R1E SEC. 20	07/01/99	34°27'N 89°13'W
BENSON	UNION	36		NEW ALBANY	ETTA	T7S R1E SEC. 21	07/01/99	34°28'N 89°13'W
BENSON	UNION	13		NEW ALBANY	ETTA	T7S R1E SEC. 21	07/01/99	34°27'N 89°12'W
21 FLOODPLAIN EASEMENTS IN 9 COUNTIES		2,195	ACRES					



Photo's 2 and 3 above. Left, the James 160 acre FmHA fee title tract and the adjoining Mabus 416 acre FmHA conservation easement. Right, the Pennington 360 acre FmHA fee title tract. These tracts are typical of our FmHA properties. Moist soil units created on these properties provide habitat for wintering waterfowl. Fallow fields provide havens for winter visitors such as short-eared owls, LeConte's sparrows, sedge wrens, and swamp sparrows. In summer, northern bobwhite, dickcissels, and eastern meadowlark nest within these islands of habitat surrounded by many square miles of cotton, corn, wheat, rice, or soybeans. Photos by Wayne Denton.

The majority of the lands in the MWMD are within the Mississippi River Alluvial Valley (MAV) where topography is relatively flat and the soil consists of heavy clays and hydric soils that have been subject to extensive clearing and drainage efforts. Originally, these lands were bottomland hardwood forests, comprised of species such as bald cypress, water oak, nuttall oak, overcup oak, water hickory, tupelo gum, red maple, sweet gum, cottonwood, black willow, and cane.

Since the MWMD was established in 1989 and assigned administrative responsibility for Dahomey and Tallahatchie NWRs, its thrust has been the creation, restoration, and enhancement of wetlands on public and private lands. Most of our work has been on properties managed by the Service, but often, we assist and work with diverse stakeholders such as the Mississippi Department of Wildlife, Fisheries and Parks (MDWFP), the Mississippi Department of Transportation (MDOT), Ducks Unlimited (DU), the Delta Wildlife Foundation, the U.S. Army Corps of Engineers (CORPs), USDA Forest Service, private and cooperate landowners, and a local K-12 school's efforts in providing an outdoor environmental classroom program. Projects with these agencies and organizations are usually done through "Partners Projects" and habitat management agreements. With few exceptions MWMD's contributions on projects with stakeholders consist of constructing earthen levees, installing water control structures, and planting bottomland hardwood seedlings. The MWMD complex has grown rapidly, and provides habitat for large concentrations of wintering waterfowl and numerous species of neotropical migrants.

Dahomey National Wildlife Refuge

Dahomey NWR is located in Bolivar County, Mississippi in the west part of the MWMD near the Mississippi River (Figure 3). In 1990, The Nature Conservancy (TNC) purchased 9,269 acres from the Allen Gray Estate and leased the land back to the Service for management. In 1993, the Service completed acquisition of TNC lands. One additional 162-acre tract was purchased by the MDOT and turned over to the Service in 1991. A 260-acre 16th section tract is leased from the West Bolivar School Board bringing the land base total to 9,691 acres.

Staffing and management of Dahomey began on a limited basis in 1991. Dahomey is presently staffed by Refuge Manager Brett Wehrle and Biological Science Technician Kim Harrigan, who are both stationed full-time at the refuge. They were both hired during 1998.

Dahomey consists of bottomland hardwood (8,198 acres), fallow field (457 acres), moist soil (85 acres), and agricultural field habitats (951 acres). Dahomey's 8,198 acres of woodlands is the largest contiguous tract of bottomland hardwood habitat occurring outside the Mississippi River mainline levee in northwest Mississippi. Therefore, Dahomey's forest lands are extremely valuable to many forms of wildlife. The Lower Mississippi River Valley Joint Venture Team has identified Dahomey as one of the top five priority sites for wintering waterfowl in the state of Mississippi.

The primary goal of the MWMD is to maintain, manage, enhance, and restore the values and functions of the alluvial plain habitats within Dahomey NWR. The primary habitat that historically occurred in the alluvial plain of the lower MAV were bottomland hardwoods. Historically, bottomland hardwoods extended hundreds of miles across this ecosystem. These expansive areas of bottomland hardwoods were subject to frequent periods of inundation. However, due to flood protection provided by Mississippi levee and drainage projects most (80%) of this area in the lower MAV was cleared and converted to primarily agricultural fields.

During a 40-year period prior to Service ownership, Dahomey's 8,198 acre hardwood forest was subject to intensive timber harvesting. However, it was never cleared, but instead allowed to naturally regenerate. Dahomey's forests are a relic of a habitat type that was once dominant throughout the lower MAV. However, stream channelization and levee construction activities that have occurred within and in the vicinity of Dahomey have reduced historical flooding regimes to the point that a significant portion of the habitat within Dahomey is no longer subject to periods of seasonal inundation. Therefore, one of the MWMD's objectives for Dahomey NWR is to restore and manage seasonal hydroperiods within its wetland habitat.

During 1994, the MWMD installed levees, pipes, and water control structures within two streams occurring within Dahomey, which created an approximately 700-acre greentree reservoir. This year, the MWMD converted an 85-acre agricultural field into a moist soil impoundment. Also, rice fields that are farmed by cooperative farmers are annually flooded after harvest. When these habitats are

Dahomey National Wildlife Refuge Bolivar County, Mississippi

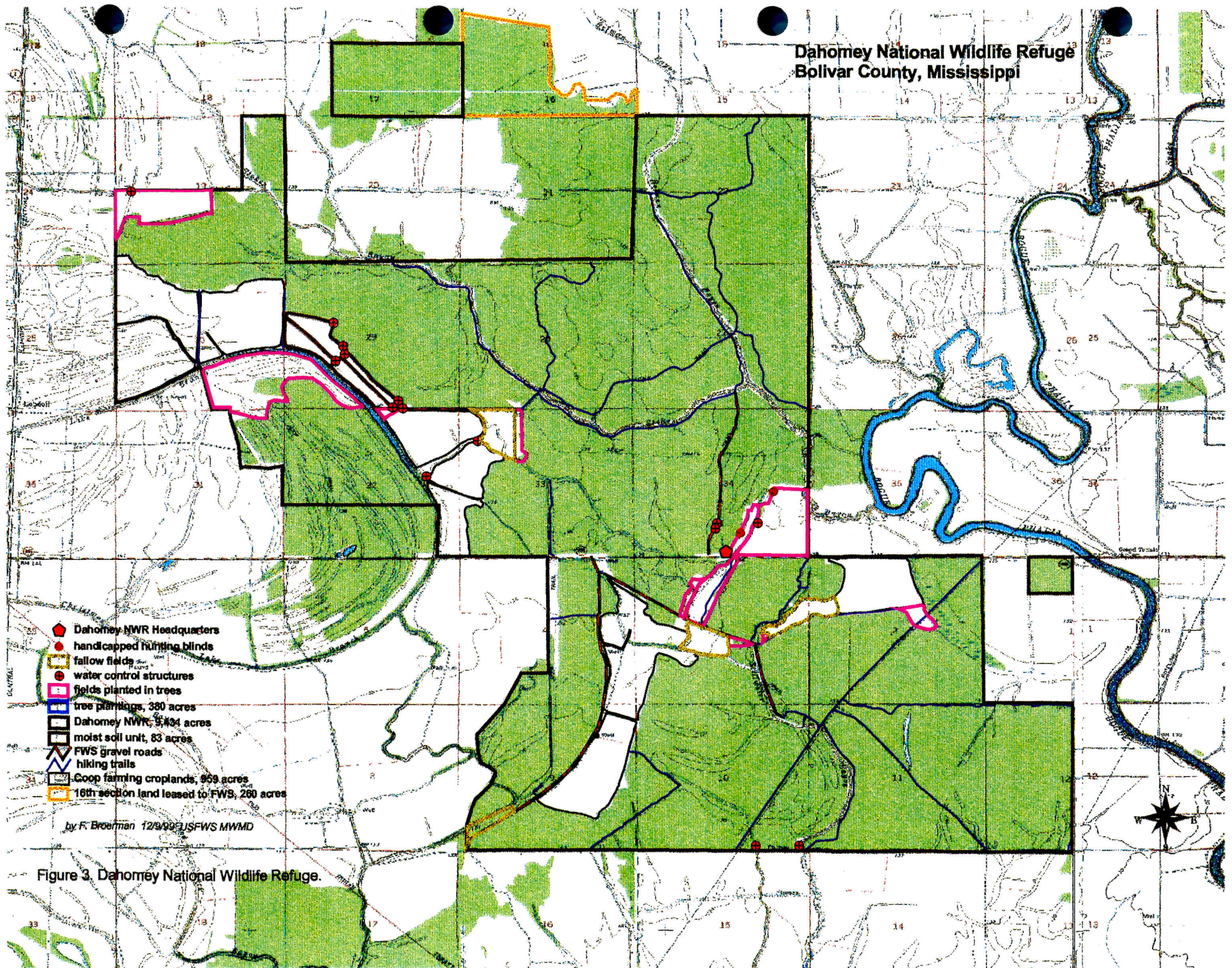


Figure 3. Dahomey National Wildlife Refuge.

flooded during winter months, they provide quality habitat for thousands of migrating and wintering waterfowl (primarily mallards, gadwalls, American wigeon, and wood ducks).

The MWMD intends to further its management efforts for waterfowl and other waterbirds by restoring and managing seasonal hydroperiods within more of Dahomey's habitats. For example, the MWMD is planning to develop additional greentree reservoirs, manage water levels in shrub swamps, and construct moist-soil impoundments within more agricultural fields at Dahomey. Also, MWMD's Forester Ramsey Russell is developing a forest management plan for Dahomey that should be finalized sometime next year. This plan will provide the necessary mechanism for the MWMD to manage forest habitat in a manner that will benefit forest interior neotropical migratory birds, waterfowl, and resident wildlife species.

Dahomey NWR has had a hunting program since 1993. Numerous sportsmen participate in deer, turkey, squirrel, and rabbit hunts that the MWMD has made available at Dahomey. Several trophy-quality white-tail deer have been harvested at Dahomey. Due to this, Dahomey has developed a reputation for having quality deer and become a favorite hunting place for many deer hunters. During 1998, for the first time, the MWMD established a waterfowl hunting season at Dahomey. There has been a substantial amount of participation in waterfowl hunting opportunities (Photo 4). Dahomey is open to waterfowl hunting again this year and the MWMD intends to continue to provide duck hunting opportunities in future years.



Photo 4. Father and son (Greg and Caleb Ellis) enjoy waterfowl opportunities at Dahomey NWR. Photo by Ramsey Russell.

Dahomey's 8,198 acre bottomland hardwood forest provides important habitat for numerous species of neotropical migratory birds such as Mississippi kite, summer tanager, ruby-throated hummingbird, wood thrush, yellow-billed cuckoo, blue-gray gnatcatcher, great-crested flycatcher, eastern wood-pewee, Acadian flycatcher, hooded warbler, prothonotary warbler, Swainson's warbler, white-eyed vireo, and red-eyed vireo. Dahomey NWR has been identified by Partners in Flight as a priority area in the lower MAV for rare or declining neotropical migratory birds. As such, Dahomey is a landmark for bird watchers.

Flocks of twenty or more wild turkeys are seen regularly during the fall and winter on Dahomey NWR. In the winter, six species of woodpeckers can be seen along with barred, great horned, screech, and short-eared owls. Dahomey NWR is truly an island of forested wetlands in a sea of agricultural lands and represents a vestige of natural habitats in the northwestern part of Mississippi.

Tallahatchie National Wildlife Refuge

Tallahatchie NWR consists of the **Bear Lake** and **Black Bayou Units** (Figures 4 and 5). These two units are 15 miles apart, (directly north or south of each other) and lie in the MAV.

The **Bear Lake Unit** is a patchwork of cultivated farmlands, old fields, and small scattered tracts of bottomland hardwood forest bisected by the meandering Tippo Bayou which is its center piece. This unit consists of 4,083 acres of fee title properties, 544 acres of conservation easements and 190 acres of floodplain easements (Figure 4). The old oxbows and low-lying fields along Tippo Bayou flood each winter and hold large concentrations of waterfowl. The Bear Lake Unit also supports a healthy deer herd. Wood ducks, eastern screech owl, barred owl, great-horned owl, loggerhead shrikes, and red-tailed hawks are common year-round residents. Blue grosbeaks, dickcissels, and painted buntings can be seen during the summer. Most of the Bear Lake Unit's agriculture land (1,028 acres) is devoted to soybeans, corn, and rice. Just south of the Bear Lake Unit lies the 9,483 acre Malmaison Wildlife Management Area which is managed by MDWFP.

The northern **Black Bayou Unit** of Tallahatchie NWR (Figure 5) consists of 2,069 acres of fee title lands, over half of which are abandoned old fields of low, poorly-drained soils which flood most winters. Several hundred acres have been reforested with hardwoods, but due to the wet nature of the area, willow and button bush thickets now dominate many acres, holding thousands of mallards during annual winter flooding. Soybeans and milo were grown by cooperative farmers on 523 acres in 1999.

A 495-acre portion of the Black Bayou Unit contains twenty-five moist soil units that were previously managed as a commercial catfish ponds (Photo 5). These moist soil units range in size from 9 to 21 acres, and are managed for shorebirds, ducks, and other marsh birds. Thirty-four species of shorebirds have been recorded here. Fifteen of these are commonly seen at the ponds from March - June and from July - October. Peregrine falcon, least tern, black tern, and wood stork occasionally pass through the refuge during migration. Bald eagles are seen regularly in winter and occasionally a golden eagle is seen. Marsh birds such as sedge wren, marsh wren, common yellowthroat, swamp sparrow, sora, and king rail are regularly seen or heard at the Black Bayou Unit. American bittern, least bittern, Lincoln's sparrow, LeConte's sparrow, and Virginia rail are seen less commonly. Beaver, bobcat, coyote, and mink occur on the refuge. Mississippi kites, dickcissels, warbling vireos, and painted buntings can be seen on the refuge during the summer. During the summer it is common to see a couple hundred egrets, ibis, and herons feeding in the moist soil units. Other waders such as snowy egrets, little blue herons, black-crowned night-heron, yellow-crowned night-heron, white ibis, and tricolored heron are occasionally seen. In the evenings during August and September large flocks of wading birds, having spent the day foraging at scattered locations in the vicinity, can be seen flying into roost in a few of the moist soil units which are filled with willow. Willow flycatchers have nested here during the summers of 1996 and 1997. This is the only location where this species is known to nest in Mississippi.

**Black Bayou Unit of
Tallahatchie National Wildlife Refuge
in Tallahatchie and Quitman Counties,
5 miles south of Crowder, Mississippi**
Latitude: 34° 5' 35"N
Longitude: 90° 8' 17"W

- nearby Fm1A fee title transfer properties, 154 acres
- Black Bayou Unit fee title acquisitions, 2068 acres
- refuge acquisition boundary
- 25 old catfish ponds, 422 acres. Average size 16 acres.
- willows
- Rotenberg's Coop Farming Fields, 187 acres
- Turner's Coop Farming Fields, 336 acres

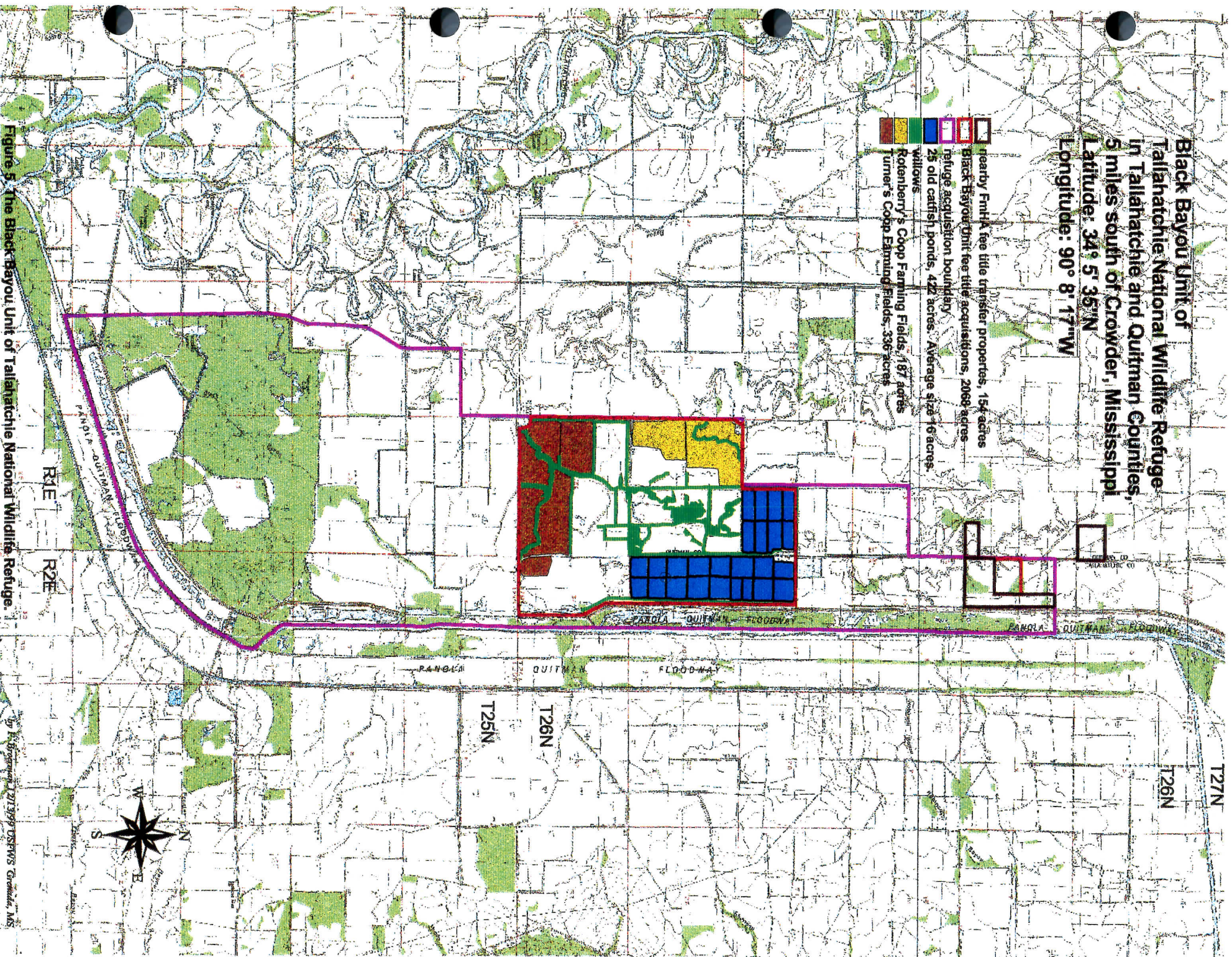


Figure 5. The Black Bayou Unit of Tallahatchie National Wildlife Refuge.

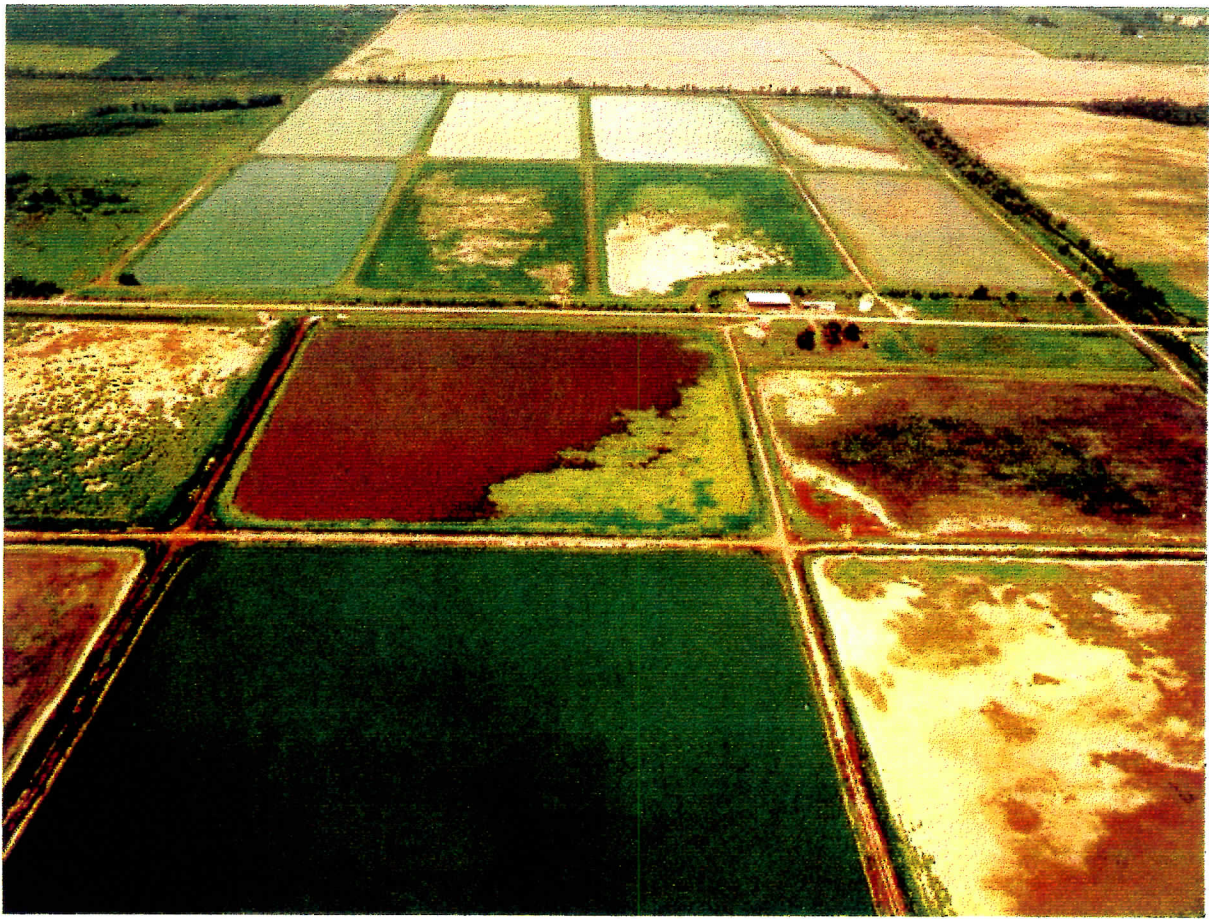


Photo 5. Aerial view of the moist soil units at the Black Bayou of Tallahatchie NWR. Photo taken by Ramsey Russell.

The twenty-five moist-soil units and nearby low-lying fallow fields of the Black Bayou Unit have a history of attracting large concentrations of waterfowl in the winter. The unit provides a juxtaposition of habitats not commonly found in the lower MAV. Black Bayou's mix of habitats and its proximity to the migration corridors of the Little Tallahatchie River and the Panola-Quitman Flood Way attract a high diversity of migrant waterbirds year round.

HIGHLIGHTS

- Refuge Operational Specialist Lee and Refuge Manager Wehrle were students at the Federal Law Enforcement Training Center in Glynco, Georgia during July-October 1999. Both men received credentials and are functioning as new Refuge Officers for the MWMD (6a).
- Five wetland enhancement projects were completed at Dahomey NWR. These projects resulted in the establishment of three moist soil units (101 acres), a greentree reservoir (15 acres), and a lake (15 acres) on the refuge (Photo 6, 3a and b).



Photo 6. Equipment Operators Billy Brasher and Don Roby place a large pipe with a full-round flash board riser water control structure in the dam site of the new lake at Dahomey NWR. Photo by Brett Wehrle.

- Two 30 acre moist soil units were constructed on the Bear Lake Unit of Tallahatchie NWR (3a and 3b).
- MWMD fire management crew conducted a prescribed burn on its 577-acre Walker Tract (3f).
- Our staff was heavily involved in the USDA's Wetland Reserve Program (WRP) in 1999. We completed ten projects in three different Mississippi Counties which resulted in wetland habitat improvements on 577 acres (5a).
- MWMD completed seven private lands' projects, which resulted in the restoration of wetland values and functions on 250 acres (5c).
- Memorandum of Understandings were developed with the Department of Biological Sciences at Delta State University to provide the opportunity for students to work at

Dahomey NWR through a Coop work program between the Service and the University. Coop student Harry Stewart reported for work at Dahomey NWR in June. He is majoring in Wildlife Law Enforcement and planning to work at Dahomey NWR during his tenure at Delta State University (5e).

- Six conservation easements totally 113 acres and a 245-acre fee title property were added to the MWMD's inventory of FmHA properties during 1999 (6h).
- Due to management efforts implemented during 1999, there was nearly a two-fold increase from 1998 in the number of shorebirds observed using the moist soil units at the Black Bayou Unit of Tallahatchie NWR (1a).
- The MWMD was awarded funding for its North American Waterfowl Management Plan (NAWMP) 1230 Special Project Proposal for management of moist soil units at the Black Bayou Unit of Tallahatchie NWR. This is the third consecutive year that we have received funding through the NAWMP (3a and 3b).

1

Monitoring and Studies

1a. Surveys and Censuses

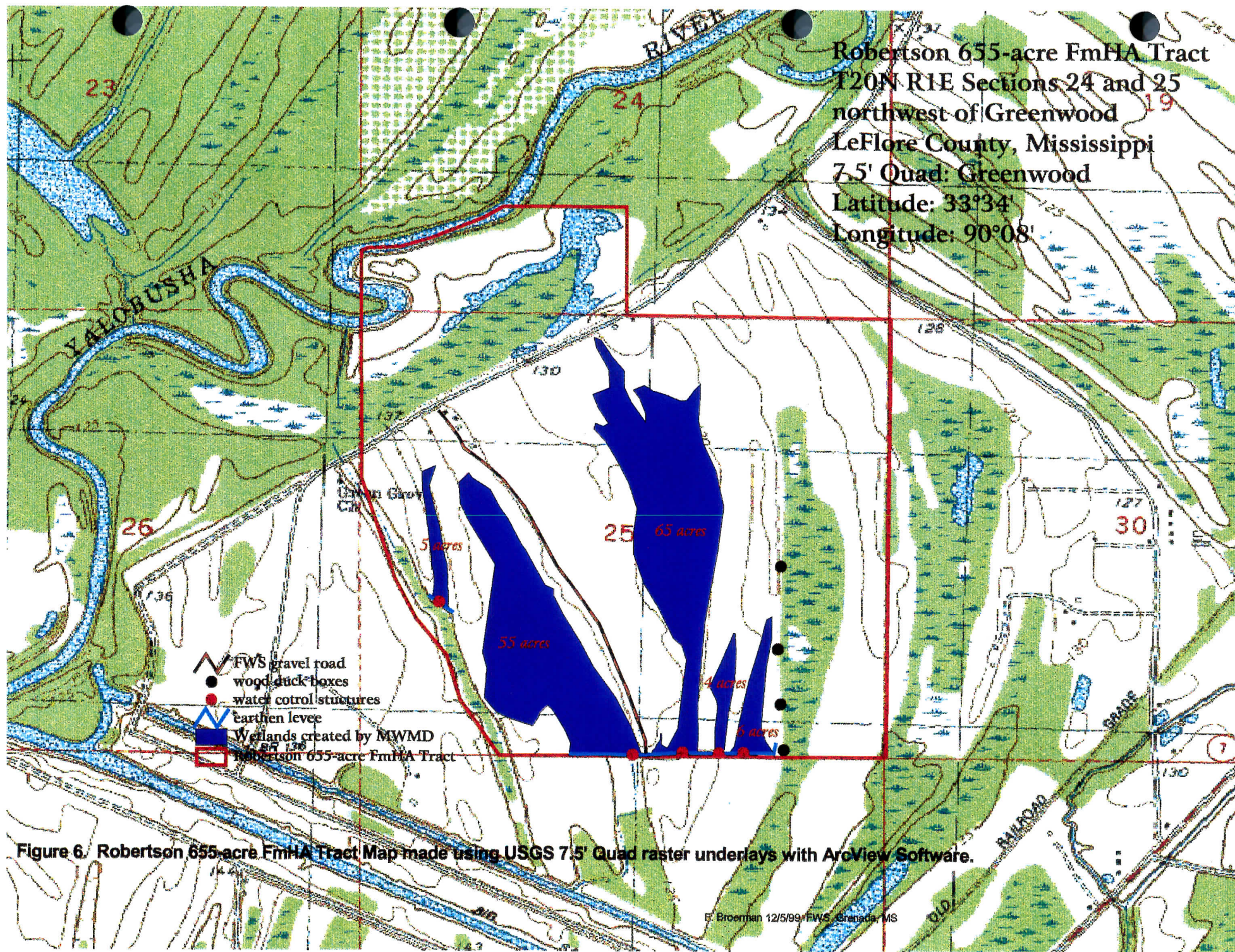
The following are significant wildlife related occurrences or events that took place on lands administered by the MWMD during 1999:

- There were three black bear sightings at Dahomey NWR in 1999. On October 21 Gayle Roark saw a bear weighing about 250 lbs. crossing Highway 446 near the intersection of the Well Road; a week later, Billy Wachter also saw a black bear in the same area; and Steve Clemons saw a bear on the edge of the woods bordering the north field off the Well Road around the same time.
- Two to three sandhill cranes were seen at Dahomey NWR in late January and early February. Historically, this species is very rare in the MAV, but more frequent sightings in recent years indicate that they may become a more common winter occurrence. A broad-winged hawk was seen at Dahomey NWR on July 1. Broad-winged hawks are not usually seen in the MAV counties of North Mississippi, but Dahomey could be one of the few places where this species may nest in this area.
- Feral pigs continue to be a nuisance and degrade habitat on Dahomey NWR and the Bear Lake Unit of Tallahatchie NWR. The population occurring at Dahomey NWR appears to have increased substantially from last year. Evidence of their activities (mainly rooting) can be seen throughout the refuge. Feral pigs caused severe damage to rice fields and dirt roads on Dahomey NWR during 1999. They also damaged rice field levees occurring on private lands located adjacent to the refuge.

- Biologist Broerman started creating maps of the FmHA properties the MWMD manages. Maps were generated using images of U.S. Geological Survey 1:24,000, 7.5' Quad Maps, and ArcView software. Topographical maps showing Service ownership or easement boundaries have been printed for more than 35 of these FmHA tracts. Several of these maps depict features such as water control structures, wood duck boxes, the levees, and the extent of the wetlands restored by the Service. Eventually the boundaries of all these properties will be mapped using the raster underlays and as time allows improvements on each property will be added. Figure 6 is an example of a map that was created for one of the properties.
- Management efforts during the summer and fall of 1999 of the moist soil units at the Black Bayou Unit of Tallahatchie NWR resulted in a twofold increase in shorebird numbers from last year. There was a fourfold increase from 1996 and 1997 (control years) when no management efforts were made to attract shorebirds. Shorebird's usage peaked from late July through early September when more than 2,000 shorebirds were seen regularly on the ponds and an average of 14 to 20 species were recorded during each count.
- John Forester and his assistant, Cedric Doolittle, from the fisheries office in Baton Rouge, conducted shock counts on two private ponds developed by MWMD in Grenada County, Mississippi
- The excellent shorebird habitat at the Black Bayou Unit of Tallahatchie NWR in 1999 and the unprecedented numbers of shorebirds using the moist soil units attracted a few species of shorebirds that are not commonly seen in the south-central region of North America. The following is a summary of these sightings: three marbled godwits were seen August 2-17, a red-necked phalarope on September 10, and a ruff on October 15.
- Besides rare shorebirds, several other birds which are rare to north Mississippi showed up at the Black Bayou Unit of Tallahatchie NWR during 1999. Six fulvous whistling-ducks were a nice surprise on April 8, one to two purple gallinules were observed during April 29 through September 21, 80-120 American white pelicans were seen from June 30 through August 26. A swallow-tailed kite was seen flying over the fallow fields of the refuge on August 21 and one was seen at the nearby York Woods on August 6th and 7th (Photo 10). Three sandhill cranes were seen on November 3rd.



Photo 10. Not often seen in north Mississippi, a swallow-tail kite was observed several times in August near the Black Bayou Unit of Tallahatchie NWR. Photo by Fred Broerman.



Aerial Waterfowl Surveys

Surveys were conducted of seven properties managed by MWMD once a month from October 23, 1998 through April 16, 1999. The flight path of these surveys and their results are shown in Figure 7 and Table 2, respectively. The beginning of waterfowl season was very dry. Many waterfowl hunting clubs which usually have plenty of water pumped water on their properties so they could hunt opening day.

Waterfowl numbers for 1998-99 surveys were lower during November, December, February, March, and April than during the two previous years of surveys. The exception to this was at Dahomey NWR, where more than 3,400 mallards were feeding on a 100-acre flooded rice field on November 24. This was the highest concentration of waterfowl recorded on Dahomey NWR in the three years standardized counts have been conducted.

January seemed to be the boom or bust month for wintering waterfowl on our properties this year. More than 50,000 ducks were seen on January 5th, the highest January count to date. Most of the waterfowl were concentrated on the Black Bayou Unit of Tallahatchie NWR (31,000) and the 655-acre Robertson Tract (8,600). Eighty percent of the ducks observed were mallards and 10% were green-winged teal. Noteworthy, were the 8,100 greater white-fronted geese observed by Wildlife Biologist Broerman and Refuge Operational Specialist Lee at the Black Bayou during a ground survey on January 4. This was an exceptionally high concentration of white-fronted geese for the MAV counties of northwest Mississippi.

Breeding Bird Surveys

Breeding bird surveys were conducted during June and early July by Wildlife Biologist Broerman and Biological Science Technician Harrigan. These routes were initiated in 1996 to collect baseline data on the distribution and relative abundance of birds that breed in northwest Mississippi. Survey routes transect habitat types typical of those found on Dahomey NWR, Tallahatchie NWR, and the numerous FmHA properties managed by MWMD (Figure 8). This year the Tallahatchie route was run twice in order to obtain a data set similar to the Tippo route, which was run twice in 1996. Data from the routes are sent to the Breeding Bird Survey Office for incorporation into their database. This data is which is then used to analyze population trends of the birds which breed within the United States. Tables 3 and 4 summarize the data collected on these two routes since their inception. It is very interesting to see how the number of individuals counted for each species compare between years.

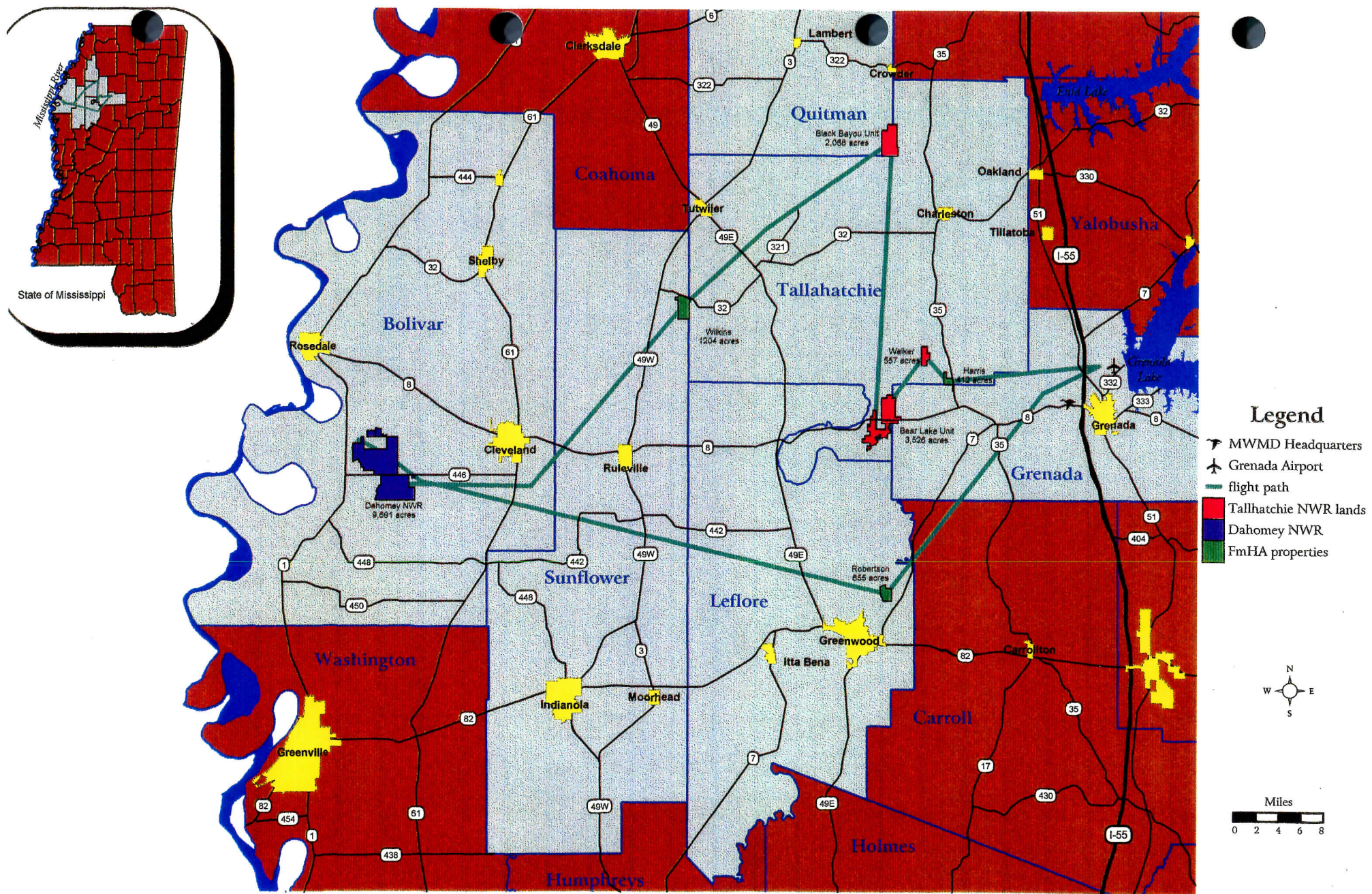
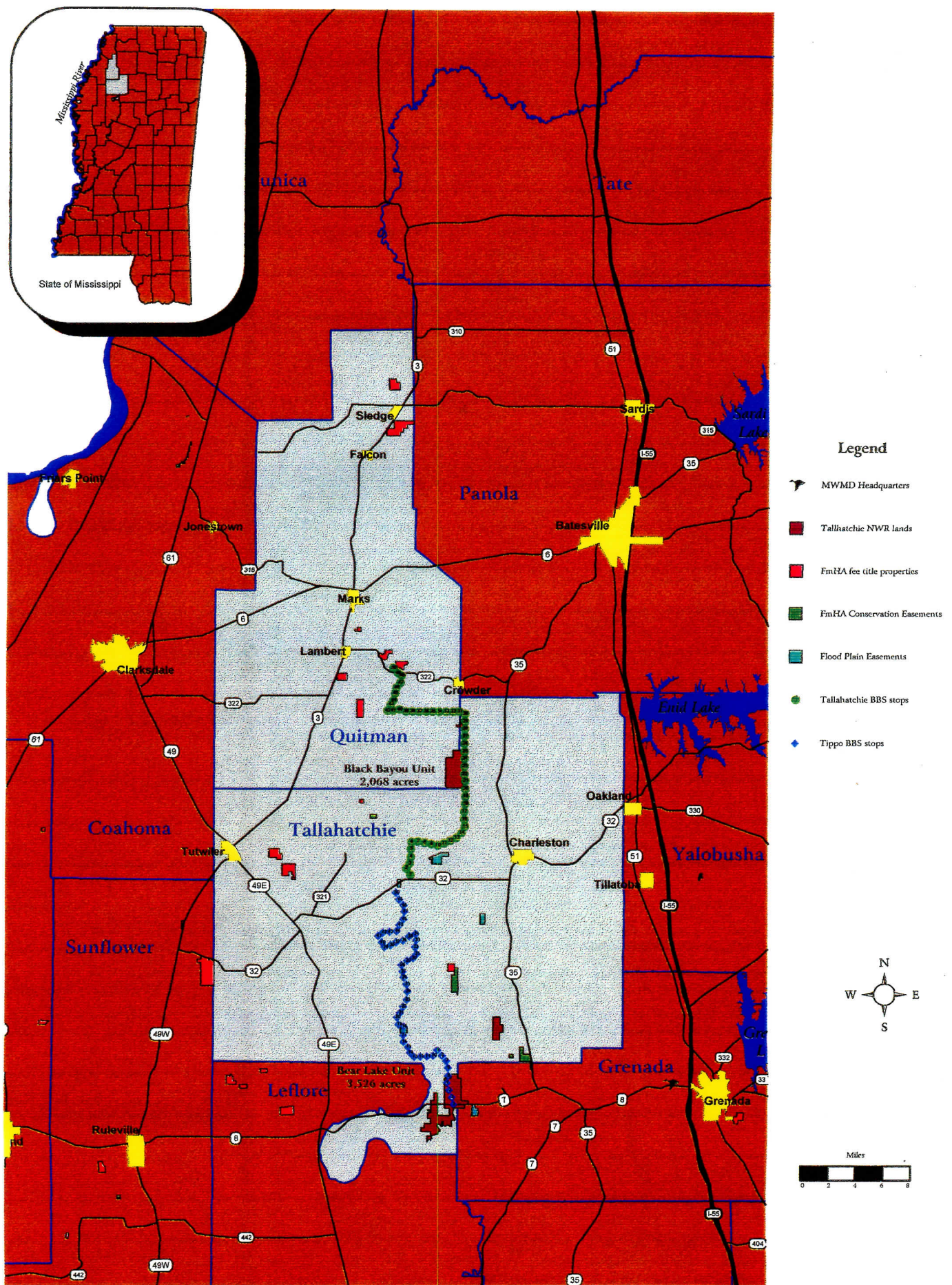


Figure 7. Flight path for 1998-99 waterfowl surveys conducted by Mississippi Wetland Management District (MWMD). by F. Broerman 1/19/99 USFWS MWMD

Table 2. Results from 1998-99 aerial waterfowl surveys of MVMD properties.

DATE	REFUGE AND FWSHA PROPERTIES SURVEYED	TOTAL # OF DUCKS	MALLARD	AMERICAN G-W TEAL	SAI WALL	NORTHERN SHOVELER	AMERICAN WIGEON	NORTHERN PINTAIL	B-W TEAL	SNOW AND BLUE GEESE	GREATER WHITE FRONTED GOOSE	CANADA GOOSE
23-Oct-98	Robertson	8	5			4						
23-Oct-98	Dahomey NWR	0										
23-Oct-98	Wilkins	0										
23-Oct-98	Tallahatchie NWR, Black Bayou Unit	905	120	490	220	40	15		20			75
23-Oct-98	Walker	0										
23-Oct-98	Harris	56	26	30								
23-Oct-98	Tallahatchie NWR, Bear Lake Unit											
23-Oct-98	DATE TOTAL	914	126	490	220	44	15	0	20	0	0	75
DATE	REFUGE AND FWSHA PROPERTIES SURVEYED	TOTAL # OF DUCKS	MALLARD	AMERICAN G-W TEAL	SAI WALL	NORTHERN SHOVELER	AMERICAN WIGEON	NORTHERN PINTAIL	OTHER DUCKS	SNOW AND BLUE GEESE	GREATER WHITE FRONTED GOOSE	CANADA GOOSE
24-Nov-98	Robertson	1,160	890		245	25						
24-Nov-98	Dahomey NWR	3,570	3,425		95			50				
24-Nov-98	Wilkins	35	35									
24-Nov-98	Tallahatchie NWR, Black Bayou Unit	2,635	2,235	70	90	170		25	45	1,500	150	
24-Nov-98	Walker	0										
24-Nov-98	Harris	1,115	1,075					40				
24-Nov-98	Tallahatchie NWR, Bear Lake Unit	371	371									
24-Nov-98	DATE TOTAL	8,866	8,031	70	430	185	0	115	45	1,500	180	0
DATE	REFUGE AND FWSHA PROPERTIES SURVEYED	TOTAL # OF DUCKS	MALLARD	AMERICAN G-W TEAL	SAI WALL	NORTHERN SHOVELER	AMERICAN WIGEON	NORTHERN PINTAIL	OTHER DUCKS	SNOW AND BLUE GEESE	GREATER WHITE FRONTED GOOSE	CANADA GOOSE
18-Dec-98	Robertson	2,760	1,150	300	600		10	700				
18-Dec-98	Dahomey NWR	171	98		63				10			
18-Dec-98	Wilkins	98	78		20							
18-Dec-98	Tallahatchie NWR, Black Bayou Unit	3,822	3,492	50	85	120	20	55			250	45
18-Dec-98	Walker	1,111	300	800					11			
18-Dec-98	Harris	6,015	2,700	400	680		20	2,200	15			
18-Dec-98	Tallahatchie NWR, Bear Lake Unit	1,284	1,071		205				8	9,000		
18-Dec-98	DATE TOTAL	16,261	8,868	1,550	1,653	120	60	2,865	44	9,000	250	45
DATE	REFUGE AND FWSHA PROPERTIES SURVEYED	TOTAL # OF DUCKS	MALLARD	AMERICAN G-W TEAL	SAI WALL	NORTHERN SHOVELER	AMERICAN WIGEON	NORTHERN PINTAIL	OTHER DUCKS	SNOW AND BLUE GEESE	GREATER WHITE FRONTED GOOSE	CANADA GOOSE
05-Jan-99	Robertson	8,600	5,300	1,200	600			1,500				
05-Jan-99	Dahomey NWR	1,055	950		100				5			
05-Jan-99	Wilkins	805	445	275	15	25		45				
05-Jan-99	Tallahatchie NWR, Black Bayou Unit	31,050	27,800	1,300	165	325	60	1,400		15,000	2,000	
05-Jan-99	Walker	100	100									
05-Jan-99	Harris	9,850	5,100	2,350	200	1,000		1,200				
05-Jan-99	Tallahatchie NWR, Bear Lake Unit	463	436		21				6			
05-Jan-99	DATE TOTAL	61,823	40,131	5,125	1,101	1,350	60	4,145	11	15,000	2,000	0
DATE	REFUGE AND FWSHA PROPERTIES SURVEYED	TOTAL # OF DUCKS	MALLARD	AMERICAN G-W TEAL	SAI WALL	NORTHERN SHOVELER	AMERICAN WIGEON	NORTHERN PINTAIL	OTHER DUCKS	SNOW AND BLUE GEESE	GREATER WHITE FRONTED GOOSE	CANADA GOOSE
17-Feb-99	Robertson	256	8		180	50	10					
17-Feb-99	Dahomey NWR	5	4		1							
17-Feb-99	Wilkins	818	8		486	325						
17-Feb-99	Tallahatchie NWR, Black Bayou Unit	1,365	552	54	238	484			37			17
17-Feb-99	Walker	424	17		330	77						2
17-Feb-99	Harris	124	2	55	40	19			8			
17-Feb-99	Tallahatchie NWR, Bear Lake Unit	42	22		20							
17-Feb-99	DATE TOTAL	3,035	611	109	1,305	855	10	0	45	0	0	19
DATE	REFUGE AND FWSHA PROPERTIES SURVEYED	TOTAL # OF DUCKS	MALLARD	AMERICAN G-W TEAL	SAI WALL	NORTHERN SHOVELER	AMERICAN WIGEON	NORTHERN PINTAIL	OTHER DUCKS	SNOW AND BLUE GEESE	GREATER WHITE FRONTED GOOSE	CANADA GOOSE
17-Mar-99	Robertson	278			107	171						
17-Mar-99	Dahomey NWR	14			12				2			
17-Mar-99	Wilkins	189	3		77	109						
17-Mar-99	Tallahatchie NWR, Black Bayou Unit	1,123	2	270	165	549	2		135			3
17-Mar-99	Walker	10			8	2						
17-Mar-99	Harris	41	1		4	18			18			
17-Mar-99	Tallahatchie NWR, Bear Lake Unit	134	8	103					25			
17-Mar-99	DATE TOTAL	1,789	12	373	273	849	2	0	180	0	0	3
DATE	REFUGE AND FWSHA PROPERTIES SURVEYED	TOTAL # OF DUCKS	MALLARD	AMERICAN G-W TEAL	SAI WALL	NORTHERN SHOVELER	AMERICAN WIGEON	NORTHERN PINTAIL	OTHER DUCKS	SNOW AND BLUE GEESE	GREATER WHITE FRONTED GOOSE	CANADA GOOSE
16-Apr-99	Robertson	0										
16-Apr-99	Dahomey NWR	1			1							
16-Apr-99	Wilkins	24	2		7	15						
16-Apr-99	Tallahatchie NWR, Black Bayou Unit	328		145	138	45						
16-Apr-99	Walker	121	1		65	40			15			
16-Apr-99	Harris	0										
16-Apr-99	Tallahatchie NWR, Bear Lake Unit	0										
16-Apr-99	DATE TOTAL	474	3	145	211	100	0	0	16	0	0	0



by F. Broerman 11/22/99 USFWS Grenada, MS

Figure 8 Breeding Bird Surveys (BBS) conducted by Mississippi Wetland Management District (MWMD) in 1999

Shorebird Counts

For the past four years, Wildlife Biologist Broerman has made a considerable effort in conducting shorebird counts within moist soil units at the Black Bayou Unit of Tallahatchie NWR. Volunteer Gene Knight (a highly-skilled bird watcher) has also assisted in this effort by sending us data of his shorebird surveys on the refuge. During the first two years (1996 and 1997) of the counts, little was done to actively manage the water levels of 25 moist soil units for shorebirds. Data collected for 1996 and 1997 were used as controls to measure and compare the effects of future management activities within the complex of moist soil units.

In 1999 eight moist soil units were managed for shorebirds, compared to six units in 1998. Management practices consisted of discing, mowing, and water level manipulations. The number of shorebirds observed using the moist soil units during 1999 was nearly two times greater than in 1998. Shorebirds exhibited nearly a fourfold increase over the control years of 1996 and 1997 (Figure 9). Not only was there a increase in total shorebird numbers, but species richness increased as well. (Figure 10 and Photo 11). Figures 11 and 12 show the chronology of summer-fall migration for two species recorded regularly during all four years of the counts.



Photo 11 How many species can you pick out? These six species were feeding in one of the moist soil units managed for shorebirds this spring at the Black Bayou Unit of Tallahatchie NWR. Photo by Fred Broerman.

Table 3. Birds seen on Tippecanoe Breeding Bird Surveys conducted in 1996-1999.
Neotropical migrants in blue.

SPECIES	05/25/96	06/13/96	06/25/97	06/02/98	06/08/99	SPECIES	05/25/96	06/13/96	06/25/97	06/02/98	06/08/99
least bittern			1			barn swallow		2	15		2
great blue heron	1	1	2	1	5	Carolina chickadee	12	6	8	14	13
great egret	2	7	10	5	6	tufted titmouse	12	7	8	11	15
little blue heron				2	20	Carolina wren	9	15	24	20	27
green heron		2			3	blue-gray gnatcatcher	1	1	2		1
white ibis		25				eastern bluebird	4	1	9	1	4
Canada goose				13		wood thrush	2	4	2	1	2
wood duck	1	6	4	4		American robin	3	2	1		2
Mississippi kite				1		northern mockingbird	18	24	25	25	26
red-shouldered hawk			1			brown thrasher	2		1	3	3
red-tailed hawk		2	2	3		European starling		2		3	9
northern bobwhite	4	6	11	22	4	white-eyed vireo			1		
common snipe*		1				warbling vireo			1		
killdeer	23	44	38	36	28	black and white warbler				1	
rock dove	4	2	3		4	yellow-throated warbler		1			
mourning dove	47	82	59	62	95	prothonotary warbler	9	2	5	10	17
yellow-billed cuckoo	22	16	24	24	22	Louisiana waterthrush		1			
great horned owl	1					Kentucky warbler			1		
barred owl	1	1				common yellowthroat	12	12	22	7	8
chimney swift	3	4	1	14	3	yellow-breasted chat	16	13	19	8	7
ruby-throated hummingbird				2		summer tanager	11	3	1	6	3
belted kingfisher			2			grasshopper sparrow				1	
red-headed woodpecker	4	8	2	1	5	northern cardinal	68	51	48	56	62
red-bellied woodpecker	37	27	27	34	49	blue grosbeak	9	11	4	4	6
downy woodpecker	2	2	5	7	7	indigo bunting	29	28	33	32	37
hairy woodpecker				2	2	painted bunting		1	1	1	3
yellow-shafted flicker	6	1	1	3	1	dickcissel	66	59	70	63	47
pileated woodpecker	2					eastern towhee	1	5			
eastern wood-pewee			1	2	1	lark sparrow	1	1	1		
great crested flycatcher	4	6	4	4	5	red-winged blackbird	191	178	115	148	101
eastern kingbird	1		1	1		eastern meadowlark	41	25	10	19	15
loggerhead shrike	5	7	4	7	4	common grackle	15	38	15	31	30
blue jay	31	23	21	17	11	brown-headed cowbird	10	14	16	18	8
American crow	2		2	1		orchard oriole	4	5	7	6	21
horned lark	18	19	12	19	34	Baltimore oriole	2	2	3	1	2
purple martin	4	6	8	2	1	American goldfinch				2	1
northern rough-winged swallow			3	2		house sparrow	16	8	8	5	21
						number of individual	789	820	745	788	803
						number of species	49	53	56	54	49

Astrisk (*) denotes a species that does not likely breed.

Table 4. Birds seen on Tallahatchie Breeding Bird Surveys conducted 1996-1999.
Neotropical migrants in blue.

SPECIES	06/02/96	06/27/97	06/23/98	06/14/99	07/02/99	SPECIES	06/02/96	06/27/97	06/23/98	06/14/99	07/02/99
pied-billed grebe	1		1		2	warbling vireo	1	2	2		
least bittern		1			1	red-eyed vireo				1	
great blue heron	6	6	10	2	8	blue jay	37	29	37	23	49
great egret	21	25	38	64	17	American crow	2	9	5		1
snowy egret	8					horned lark	12	1	1	5	3
little blue heron		1	1	1		purple martin	1	11	9	25	21
cattle egret		8	1		1	northern rough-winged swallow	2	2		4	1
green heron	4	3	2	5	2	cliff swallow			7		2
black-crowned night-heron		1		2		barn swallow	36	29	15	21	11
yellow-crowned night-heron		1				Carolina chickadee	8	11	6	2	2
Canada goose	6		10	2		tufted titmouse	6	5	3	7	10
wood duck	12	4		9	7	Carolina wren	21	25	13	31	26
mallard	2					blue-gray gnatcatcher		2			2
Cooper's hawk			2			eastern bluebird	2		4		1
red-tailed hawk		3	1			wood thrush	3	1	3	1	1
northern bobwhite	27	53	40	15	20	American robin	1	5	5	2	
American coot		1				northern mockingbird	22	32	24	14	23
killdeer	28	30	37	21	22	brown thrasher	8	1		3	3
rock dove	1	2	2			European starling		27	2	37	36
mourning dove	106	99	60	80	63	prothonotary warbler	6	14	16	11	6
yellow-billed cuckoo	44	54	29	24	33	common yellowthroat	38	26	29	21	37
great horned owl		1		1		yellow-breasted chat	27	34	38	34	31
barred owl	1					summer tanager	3		3	1	1
chimney swift	6	1	3	6	2	eastern towhee	13	11	16	11	15
ruby-throated hummingbird				3	2	northern cardinal	44	50	45	49	33
belted kingfisher	1	4	1	2	5	blue grosbeak	5	5	9	7	9
red-headed woodpecker	7	1	1	1		indigo bunting	29	48	36	45	46
red-bellied woodpecker	21	38	26	28	23	painted bunting	2	4	10	1	6
downy woodpecker	3	5	7	6	6	dickcissel	55	67	52	66	48
hairy woodpecker			3	3	3	red-winged blackbird	171	176	121	171	124
yellow-shafted flicker		4	2	2	4	eastern meadowlark	30	27	24	27	19
pileated woodpecker	1	1		1	1	common grackle	45	59	78	61	37
eastern wood-pewee		6	1	1	1	brown-headed cowbird	36	14	30	31	20
great crested flycatcher	5		2	4	4	orchard oriole	5	18	7	20	9
eastern kingbird	4	1	3	1	1	Baltimore oriole	11	13	7	4	4
loggerhead shrike	5	7	5	2	5	house sparrow	16	39	31	42	31
white-eyed vireo			1		2	number of individuals	1018	1158	977	1064	903
						number of species	55	59	58	56	57

Figure 9. Number of individuals seen during summer and fall shorebird counts conducted at the old catfish ponds of the Black Bayou Unit of Tallahatchie NWR.

	1996	1997	1998	1999
Mean	207.49	234.38	585.67	1058.44
STDERR	28.53	25.01	52.50	100.65
n	39	66	63	59

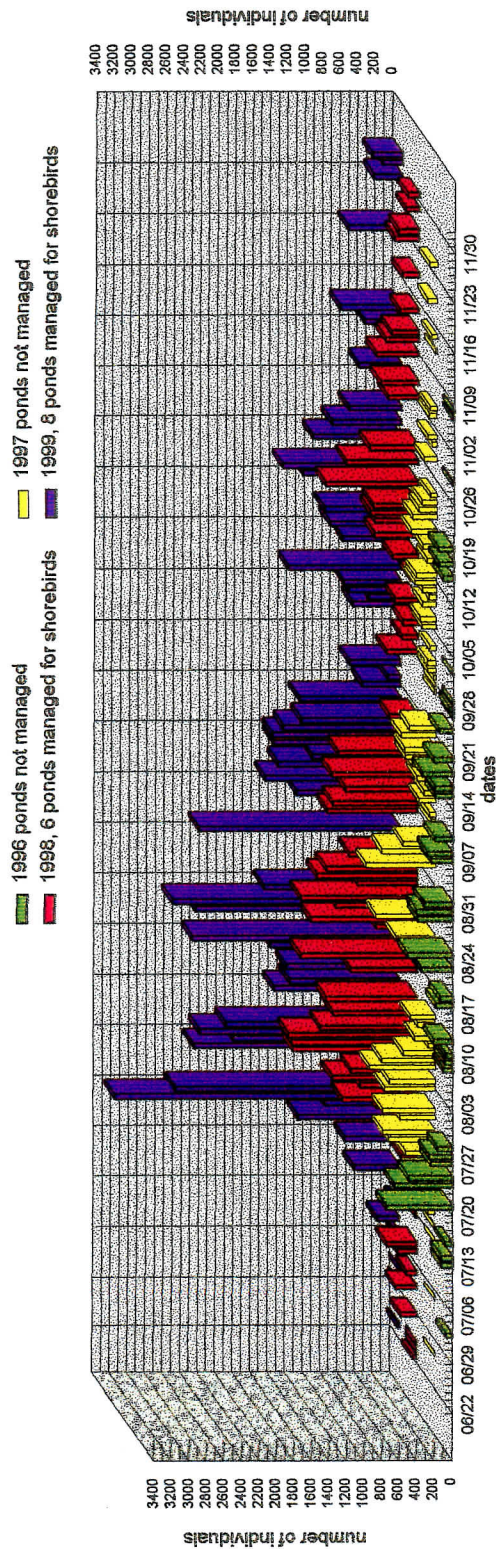


Figure 10. Number of species seen during summer and fall shorebird counts conducted at the old catfish ponds of the Black Bayou Unit of Tallahatchie NWR.

	1996	1997	1998	1999
Mean	8.97	7.79	10.62	11.19
STDERR	0.62	0.41	0.53	0.57
n	39	66	63	59

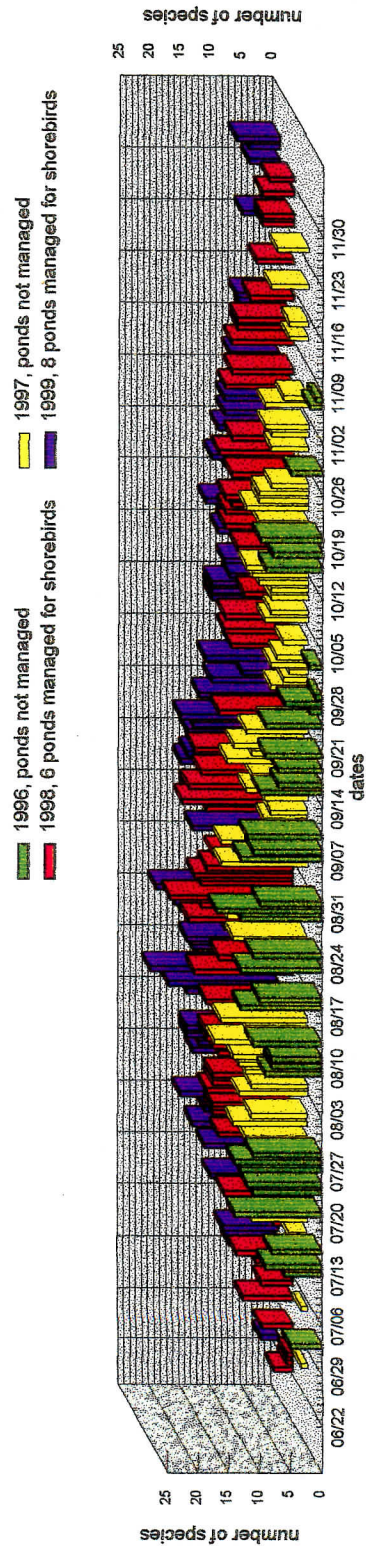


Figure 11. Lesser yellowlegs numbers seen during summer and fall shorebird counts conducted at the Black Bayou Unit of Tallahatchie NWR from 1996 - 1999.

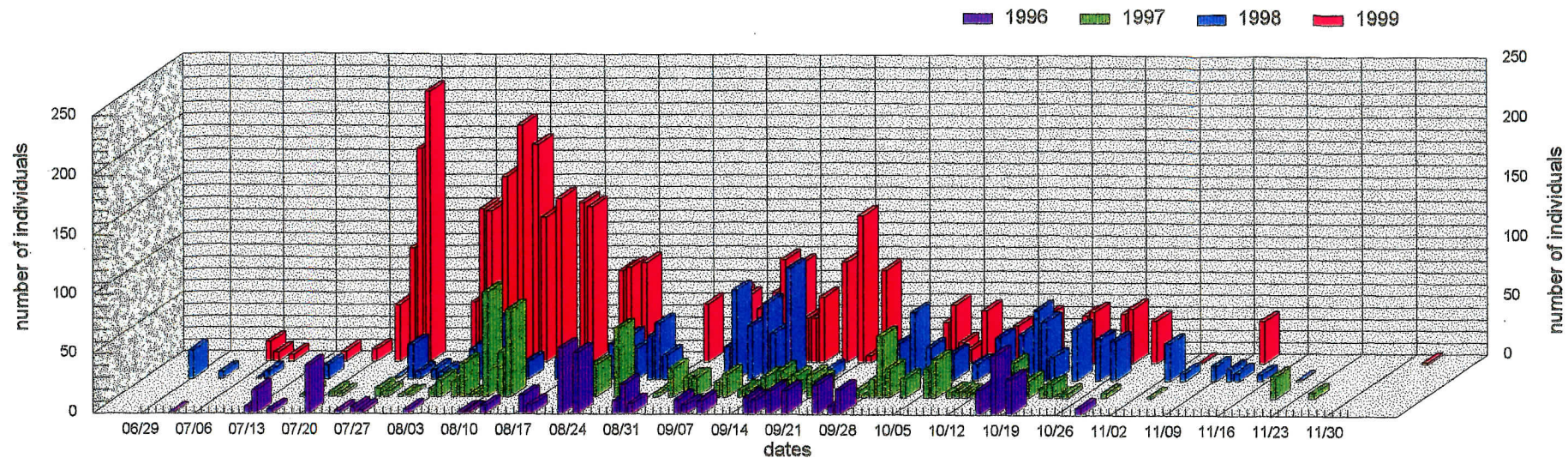
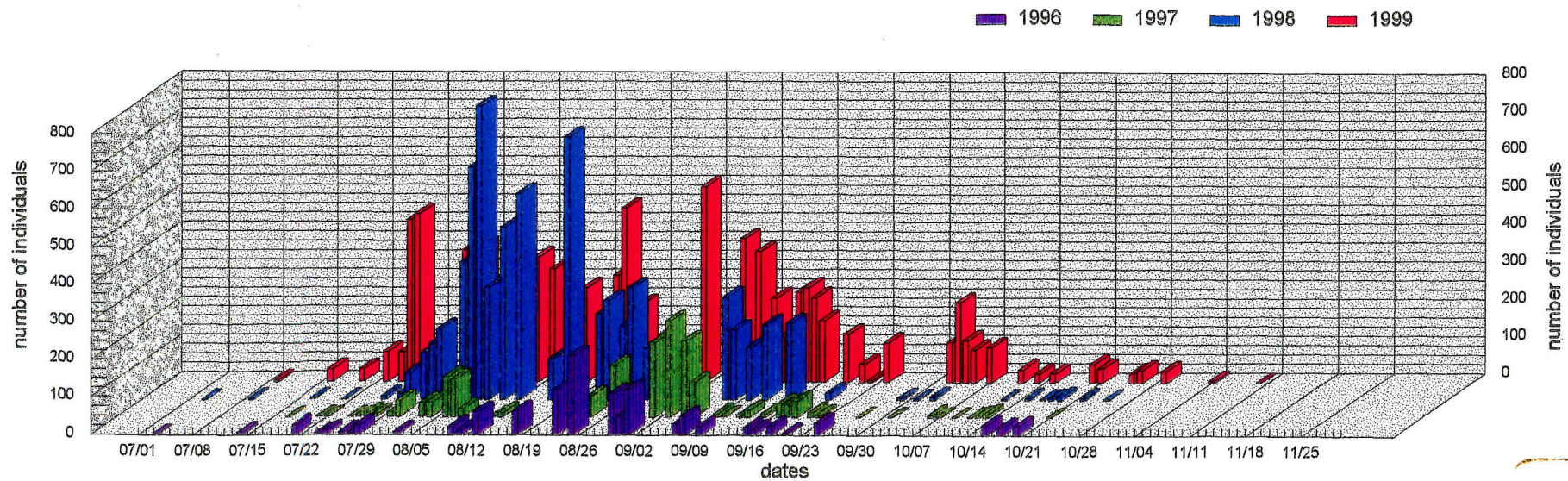


Figure 12. Pectoral sandpiper numbers seen during summer and fall shorebird counts at the Black Bayou Unit of Tallahatchie NWR from 1996 - 1999.



1b. Studies and Investigations

During the 1998-99 planting season, the Mississippi Forestry Commission (MFC) completed planting a Nuttall oak progeny test on the Bear Lake Unit of Tallahatchie NWR. Bare-root stock from seed sources throughout Mississippi, Louisiana, and Arkansas were planted. The planting was one of many experimental replications throughout the lower MAV necessary to identify, from more than 250 families, genetically reliable sources of quality Nuttall oak. This particular replication encompasses about 7.5 acres and consists of four genetic sources. Seedlings were planted during the early spring. During the midsummer months, herbaceous competition was kept in check by direct herbicide applications. Vines were removed from each of the 2,300 seedlings by hand! Survival, height, and diameter of seedlings will be monitored by MFC personnel for the next 20 years. Nuttall oak is prized in the lower MAV for both its commercial and wildlife values.

To assess breeding bird and tree species richness, the U.S. Geological Survey implemented a research project in 1997 that consisted of planting supplemental patches of eastern cottonwood and American sycamore on sites that were recently reforested with oaks and other hard-mast species. Replications have been installed in subsequent years on several properties administered by the MWMD, and in 1999 several additional replications were installed at the Bear Lake Unit of Tallahatchie NWR. Replications consist of three planted plots that each encompass about 1730 square feet. Breeding bird richness will be assessed at 2 and 5-years post-plant. An annual progress report has not yet been provided.

A special use permit was issued to Mississippi State University graduate student, Tim Fulgam, to collect data pertinent to survival and species composition of reforested areas on properties administered by the MWMD. The information will comprise a small part of a database representing regeneration areas throughout the lower MAV.

2

Habitat Restoration

2a. Wetland Restoration: On-Refuge

About 1,337 acres were reforested to bottomland hardwood species during the 1998-99 planting season. Reforestation projects consisted of 460 acres on the Bear Lake Unit of Tallahatchie NWR and 877 acres on FmHA properties. MDOT mitigation land properties that were transferred to the Service, accounted for 388 acres. Under contract, 236 acres were machine-planted by Mississippi Delta Reforesters Limited Liability Company. One hundred fifty-two acres were hand-planted by local contract planter David Musselwhite. MWMD personnel machine-planted about 950 acres (Photo 12). Native hardwoods were planted at the minimum rate of 302 seedlings per acre. On and off-refuge reforestation projects for the 1998-99 planting season are summarized in Table 5.

Mississippi Delta Reforesters Limited Liability Company experienced equipment problems using a single coulter blade planting configuration mounted onto a three-point hitch draw bar and pulled by a rubber-tracked tractor. Where field conditions did not consist of extremely wet soils, their tractor could not pull the planting equipment while running the coulter deep enough to allow for adequate planting depth of seedlings. For this reason, they were unable to plant all of the acreage initially assigned.

During November 1999, when the dieback of herbaceous growth was sufficient for reliably locating seedlings, hardwood reforestation inspections were conducted on 654 acres of MDOT projects. The Service is required to perform inspections of MDOT mitigation lands during each of three years after they are planted. Inspections consisted



Photo 12. Equipment Operator Hal Jones plants hardwood seedlings from the MWMD's tree planter. MWMD personnel machine-planted 950 acres of refuge, WRP, and FmHA lands in northwest Mississippi during January-March 1999. Photo by Ramsey Russell.

Table 5. Number (in thousands) and percent composition of hardwood seedlings allocated to 1998-99 reforestation projects, USFWS MWMD.
Final Update 03/09/1999.

	Tall NWR - Bear L.				PROJECT												PVT Lands		TOTAL
	DOT Mitigation Lands	Field# 44	Field# 34	Field#51	WRP Byrd	Dean	Edwards	Speirs	CRP DeLoach CRP	FmHA Clifton	Scott	Staten	Starr 320	Robertson 655	Hester	Misc.	Holden		
Acreage	388	29	24	19	120	143	45	33	102	93	40	74	150	370	150		20.5	1800.5	
Species																			
Bald cypress	10.35	2	1		6	0.75	1.75			0.6				2		1.1	0.2	25.75	
Black gum									0.6		0.5	0.7	1	1.1	0.8		0.6	5.3	
Green ash	12.1	0.2	0.4		5.2	3.5	1.2	0.4	0.5	2		0.8	1.6	0.2	0.6		0.2	28.9	
Hackberry	1									0.5				0.5	0.5			2.5	
Sweet Pecan	2					0.5				1		0.5					0.5	4.5	
Persimmon	3.1	0.1				0.3	0.4	0.2	0.8	0.3		1.2				0.2	1.3	7.9	
Red Maple	0.5									0.5		0.5		0.25	0.75		0.5	3	
Sweetgum	16.5	1.5	1.75		5.5	3.75	2.75	0.8	0.2	3.25		0.45		0.2	0.1	0.25	0.45	37.45	
Sycamore	0.2				0.1							0.4					0.1	0.8	
Cherrybark Oak	3	1.4	2.8		0.8					0.6		1.6		1.2		1.6	1	14	
Nuttall Oak	40.1	1.2	1	2.8	12.4	16.6	4.95	6.6	18	10	2.5	13.5	9.1	27.8	5.8	0.75	1.4	174.5	
Laurel Oak	0.25											0.25		0.25				0.75	
S. Chestnut O.												0.25						0.25	
Overcup Oak	6	0.6	0.6	0.8	4	0.4	0.8		2.85	1.2		0.35		26.55	19	0.2		63.35	
Shumard Oak	1.5									1.3	6.2					0.3		9.25	
Water Oak	11.5	1.2		1.05	4	9.75	2.6	1.35	3.95	5.05	1.2	1.85	5.3	13.15	5.5	1	0.6	69.05	
Willow Oak	15.6	1.4		1.6	4.8	8	2.8	1.8	7.75	2.8	2.6	1	8.7	11.8	8.4	0.1	0.6	79.75	
Total	123.7	9.6	7.55	6.25	42.8	43.55	17.25	11.15	34.65	29.1	12.95	23.35	25.7	85	42.55	4.6	7.25	519.8	

Summary

Stems per acre	318.8	331.0	314.6	328.9	356.7	304.5	383.3	337.9	339.7	312.9	323.8	315.5	171.3	229.7	283.7		353.7	288.7
Composition (%)																		
Oak	63.0	60.4	58.3	100.0	60.7	79.8	64.6	87.4	93.9	72.0	96.1	80.5	89.9	95.0	91.0		49.7	79.1
Bald Cypress	8.4	20.8	13.2	0.0	14.0	1.7	10.1	0.0	0.0	2.1	0.0	0.0	0.0	2.4	2.6		0.0	5.0
Blackgum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.0	3.9	3.0	3.9	1.3	1.9		8.3	1.0
Green Ash	9.8	2.1	5.3	0.0	12.1	8.0	7.0	3.6	1.4	6.9	0.0	3.4	6.2	0.2	1.4		2.8	5.6
Hackberry	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.0	0.0	0.0	0.8	1.2		0.0	0.5
Sweet Pecan	1.6	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0	3.4	0.0	2.1	0.0	0.0	0.0		6.9	0.9
Persimmon	2.5	1.0	0.0	0.0	0.0	0.7	2.3	1.8	2.3	1.0	0.0	5.1	0.0	0.0	0.0		17.9	1.5
Red Maple	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.0	2.1	0.0	0.3	1.8		6.9	0.6
Sweetgum	13.3	15.6	23.2	0.0	12.9	8.6	15.9	7.2	0.8	11.2	0.0	1.9	0.0	0.2	0.2		6.2	7.2
Sycamore	0.2	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.0	0.0	0.0		1.4	0.2
Cherrybark Oak	2.4	14.6	37.1	0.0	1.9	0.0	0.0	0.0	0.0	2.1	0.0	6.9	0.0	1.4	0.0		13.8	2.7
Nuttall Oak	32.4	12.5	13.2	44.8	29.0	38.1	28.7	59.2	51.9	34.4	19.3	57.8	35.4	32.7	13.6		19.3	33.6
Laurel Oak	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.3	0.0		0.0	0.1
S. Chestnut O.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0		0.0	0.0
Overcup Oak	4.9	6.3	7.9	12.8	9.3	0.9	4.8	0.0	8.2	4.1	0.0	1.5	0.0	31.2	44.7		0.0	12.2
Shumard Oak	1.2	0	0	0	0	0	0	0	0	4.5	47.5	0.0	0	0	0		0	1.8
Water Oak	9.3	12.5	0.0	16.8	9.3	22.4	15.1	12.1	11.4	17.4	9.3	7.9	20.6	15.5	12.9		8.3	13.3
Willow Oak	12.6	14.6	0.0	25.6	11.2	18.4	16.2	16.1	22.4	9.6	20.1	4.3	33.9	13.9	19.7		8.3	15.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0	

by Ramsey Russell, Administrative Forester

c:\ramsey russell\projects\reforestation\9899 reforestation summary

of 0.5 - 1% sampling using 0.02-acre circular plots distributed randomly across the planted acreage. Plot distribution was weighted according to field size. All planted and natural woody regeneration within plot boundaries were tallied. Ancillary observations specific to site conditions, probable factors contributing to success or failure and wildlife use are also documented.

Second-year establishment of regeneration on 1998-99 MDOT projects at the Bear Lake Unit of Tallahatchie NWR, is about 200 ± 24 (at 95% confidence limit) stems per acre. Species composition is comprised primarily of oak species. Other species of importance include American Sycamore, bald cypress, black tupelo, green ash, and persimmon (Table 6).

First-year establishment of regeneration on 1998-99 MDOT projects at the Bear Lake Unit of Tallahatchie NWR, was about 149 ± 24 (at 95% confidence limit) stems per acre. Due to the paucity of live stems present, about 258 acres will likely be scheduled for replant in upcoming seasons (Table 7). Overflow from Tippo Bayou, lack of precipitation, and the opening of machine planting trenches contributed to these perceived planting failures.

The natural opening of planter trenches is commonly documented on projects that were machine planted in the Mississippi Delta. The problem is associated with the heavy, shrink-swell clay soils of the region that expand during the wet winters and contract during the dry summer. As the soils contract, large voids are sometimes created in the seam made by the coultter blade and seedling roots are exposed.

2b. Upland restoration: Off-refuge

Nothing to report.

2c. Wetland restoration: Off-refuge

During the 1998-99 planting season, MWMD personnel machine planted hardwood seedling on 443 acres in Tunica, Quitman, Bolivar Counties, Mississippi. These are all WRP lands that were contracted for tree planting by the USDA Natural Resource Conservation Service (NRCS). One hundred and two acres of previously farmed land enrolled in the USDA's Conservation Reserve Program (CRP) was reforested through a Service's Partner's for Wildlife agreement with two landowners in Grenada County. Additionally, about 21 acres of forested habitat was restored through another Partners for Wildlife agreement with an individual landowner in Grenada County. Off-refuge wetland restoration projects are summarized in Table 5.

2d. Upland restoration: Off-refuge

Nothing to report.

Table 6. Second-year summary of seedlings per acre (mean \pm standard error) and relative species composition of 1998 reforestation projects on Mississippi Department of Transportation mitigation lands at the Bear Lake Unit of Tallahatchie NWR. Inspections were conducted November 1999.

Field Number	Acreage	Stems per Acre ¹	Limit of Error	Relative Species Composition
5	6	150 \pm 124	19	Cherrybark oak 77.8 Willow oak 22.2
6	13	83 \pm 44	52	Cherrybark oak 80.0 Sweet pecan 20.0
7	13	133 \pm 72	12.5	Cherrybark oak 100.0
8	19	120 \pm 94	28.2	Cherrybark oak 16.7 Overcup oak 25.0 Willow oak 58.3
9	23	158 \pm 153	37.7	Green ash 36.8 Sweetgum 10.5 Sycamore 21.1 Water oak 26.3 Willow oak 5.3
10	81	250 \pm 76	11.5	Baldcypress 14.0 Green ash 2.0 Nuttall oak 8.0 Overcup oak 20.0 Persimmon 2.0 Water oak 38.0 Willow oak 16.0
13	25	225 \pm 72	12	Baldcypress 80.9 Overcup oak 4.8 Water oak 4.8 Willow oak 9.5
14	15	263 \pm 40	4.7	Baldcypress 100.0
15 & 16	7	167 \pm 72	10	Blackgum 30.0 Green ash 30.0 Overcup oak 30.0 Sweetgum 10.0
17	71	228 \pm 32	3.3	Blackgum 17.1 Cherrybark oak 8.5 Green ash 4.9 Nuttall oak 1.2 Overcup oak 8.5 Sweet pecan 2.4 Water oak 6.1 Willow oak 47.6
Total 1998 Projects	273	200 \pm 24	5.1	

¹ Confidence limits equal 95%.

Table 7. First-year summary of seedlings per acre (mean \pm standard error) and relative species composition of 1999 reforestation projects on Mississippi Department of Transportation mitigation lands at the Bear Lake Unit of Tallahatchie NWR. Inspections were conducted November 1999.

Field Number	Acreage	Stems per Acre ¹	Limit of Error (%)	Relative Species Composition (%)
24	10	225 \pm 80	11	Nuttall oak 16.7 Water oak 61.1 Willow oak 22.2
32	76	211 \pm 37	8.4	Baldcypress 6.2 Nuttall oak 77.5 Shumard oak 5.0 Sweetgum 5.0 Water oak 1.3 Willow oak 5.0
37	11	100 \pm 124	57	Green ash 50.0 Nuttall oak 50.0
38	225	87 \pm 27	18.4	Baccharis 1.9 Green ash 21.2 Nuttall oak 40.4 Overcup oak 1.9 Sweetgum 15.4 Water oak 17.3 Willow oak 1.9
40	31	231 \pm 31	5.7	Baldcypress 10.8 Green ash 13.5 Nuttall oak 29.8 Overcup oak 8.1 Sweetgum 24.3 Sweet pecan 2.7 Sycamore 2.7
41	6	325 \pm 300	7	Baldcypress 76.9 Sweet pecan 23.1
59	22	0	na	na
Total 1999 Projects	381	149 \pm 24	7.9	

¹ Confidence limits equal 95%.

3

Habitat Management

3a. and b. Manage water levels and moist soils units

In 1999 the MWMD was awarded \$10,000 for it's NAWMP (1230) Special Project Proposal for assistance with its shorebird and waterfowl management activities at the Black Bayou Unit of Tallahatchie NWR. The funding allowed us to replace a 20-horsepower electric submersible pump and paid some of the pumping costs associated with providing shorebird habitat during the dry summer and fall months.

Four water control structures (WCS) designed for raising catfish were replaced with four flash board riser WCS at the Black Bayou Unit. WCS were placed in levees of two moist soil units that had none previous to 1999. These new WCS allow us to manage water levels within 102 additional acres of moist soil habitat.

Two WCS were installed on the Bear Lake Unit of Tallahatchie in 1999. A 30-acre moist soil unit was built this summer on the east edge of the Bear Lake Unit, next to the north side of Highway 8. Motorists traveling on Highway 8 can readily view this moist soil unit. A 10'x10'x4' WCS that will flood about 30 acres, was installed by our equipment operators and Joey Wilson of J&G Pipe, on a 10' culvert beneath the dummy line road south of Highway 8 (Photo 13). Due to these projects, waterfowl and other waterbird use of the Bear Lake Unit will be greatly enhanced.

A total of eight pipes fashioned with flash board riser WCS were installed on Dahomey NWR during 1999. An 85-acre moist soil unit was established within an agricultural field on the northwest side of the refuge by building one new levee and installing two pipes in it. This field was precision leveled in 1995, making flooding capabilities outstanding. Rice and soybeans were grown in this field for several years. Soybean stubble was flooded in this field last winter and at times 200-300 waterfowl utilized it. Moist soil management will increase waterfowl and other waterbird use of this field in future years.

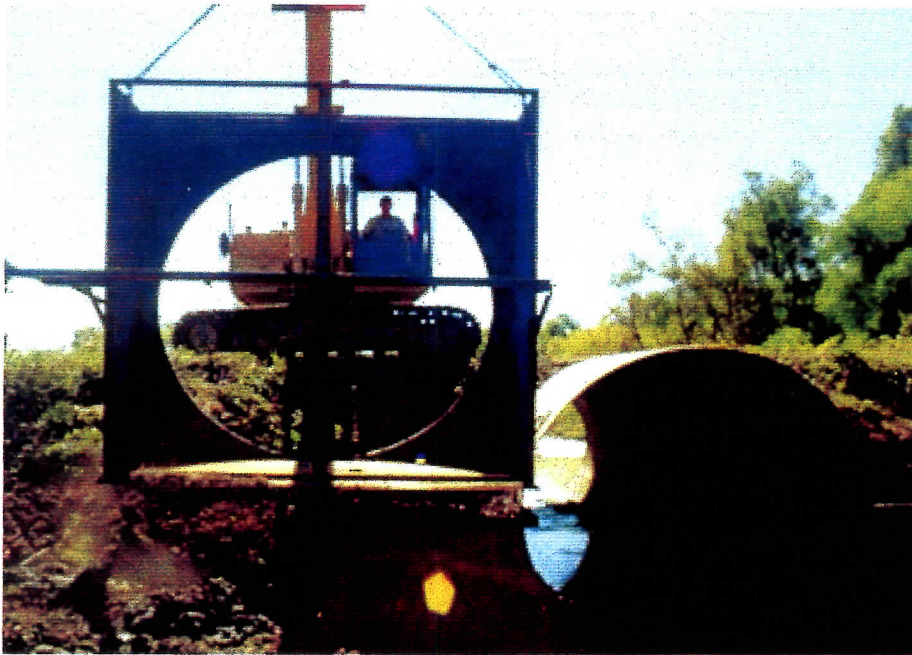


Photo 13. A large water control structure (10'x10'x4') was installed under the dummy line road on the Bear Lake Unit of Tallahatchie NWR in late September by MWMD Equipment Operators and Joey Wilson of J & G Pipe. Photo by Fred Broerman.

Two more moist soil units were established at Dahomey NWR by replacing two old worn out pipes within existing levees crossing two separate ephemeral streams. Two levees were rehabilitated and new 18"X20' pipes with flash board riser WCS were placed in them. The new moist soil units are located just east of the Dahomey Headquarters and on the northwest corner of refuge. The northwest and headquarter units will allow for flooding within approximately six and ten acres, respectively of existing fallow field habitat. Due to past stream channelization and levee construction activities historical flooding regimes within these areas were eliminated. Consequently, the vegetation occurring in these areas consists of dry site species, such as ragweed and goldenrod. Restoration of seasonal hydrology and implementation of habitat management activities (i.e., disking) will result in establishment of endemic moist soil vegetation within flooded areas of these units. These areas will provide excellent habitat for waterfowl and other waterbirds.

An approximately 15-acre lake was established on the west side of Dahomey by constructing a dam across an existing drainage that dissects two agricultural fields. A 18"X80' steel pipe with 30"X10.5' full-round center riser was placed in the dam to allow for water management capabilities. Extensive shallow water areas located along the periphery of the lake will be managed for establishment of moist soil vegetation beneficial for waterfowl and other waterbirds. The lake will hold approximately six to eight feet of permanent water and plans are being made to stock it with fish during the year 2000 and eventually open the lake for fishing by the general public.

Construction of a new gravel road on Dahomey NWR in 1998 resulted in winter flooding of approximately 15 acres of bottomland hardwood habitat. When an existing dirt road located just west of the Dahomey Headquarters was rehabilitated and graveled, no new pipes were installed in it. After receiving heavy rains in January 1999, water was impounded in a 15-acre area of forested habitat by the new road. Large numbers of mallards and wood ducks were seen utilizing this area of flooded timber during January-February. Since no pipes were installed in the road, refuge personnel could not draw the water out of the flooded timber. Therefore, in March 1999 MWMD Equipment Operators installed two 12"X15' steel pipes fashion with flash board riser WCS in the road. The pipes with flash board risers established water management capabilities within a 15-acre greentree reservoir.

Our equipment operators built levees and made repairs on existing levees on seven of the MWMD's FmHA properties. These projects and those completed on refuge lands during 1999 are summarized in Table 8.

There are a total of 144 WCS on properties managed by MWMD. Numerous earthen levees and ditch plugs catch water in the wet winter months and often hold water throughout most of the summer. About 92 of the WCS were installed by MWMD personnel during the past ten years. These WCS are constructed using round pipes 18 to 30 inches in diameter and 30 to 60 feet long. Either aluminum, steel second-hand natural gas line, or coated (polymer or tar) galvanized steel pipes are used. A flash board riser is attached on one end of the pipes which allows water levels to be adjusted by dropping in or pulling out boards (usually 24" or 30" lengths of 2 X 8 lumber). There are 60 WCS on 26 FmHA fee title properties and 12 on FmHA conservation easements. The Black Bayou Unit of Tallahatchie NWR has 31 water control structures and the Bear Lake Unit has 21. There are 15 WCS at Dahomey NWR.

Due to the limitations of a small maintenance staff, passive management is used on many of the moist soil units located on FmHA properties. On many of these properties boards remain in many WCS all year and are only removed when mechanical treatments (bush hogging or disking) are necessary to arrest succession of moist soil vegetation.

We also maintain one 800-acre greentree reservoir at Dahomey NWR. A two year rotational winter flooding regime is utilized for water management within this area in order to avoid water damage to bottomland hardwood forest.

Table 8. Summary of water management projects constructed by the MWMD during 1999.

Refuge and FmHA Projects	County	number of water control structures (WCS) and levees built	Estimated acres of moist soil (MS) or permanent wetlands created
Dahomey NWR	Bolivar	3 levees and 8 WCS	131
Tallahatchie NWR Bear Lake Unit	Grenada and Tallahatchie	2	60
Tallahatchie NWR Walker Tract	Tallahatchie	1	this structure was added as a second WCS in a 262-acre MS
Tallahatchie NWR Black Bayou Unit	Quitman and Tallahatchie	6	102
Starr 750-acre FmHA Tract	Quitman	1 levee and 1 WCS	30
Trainor 188-acre FmHA Tract	Quitman	2 levees	50
Povall 180-acre FmHA Tract	Sunflower	2 levees and 2 WCS	30
Gwinn 343-acre FmHA Tract	Leflore	repair work on existing levee	
Goss 543-acre FmHA Tract	Bolivar	installed 2 WCS	12
Mabus 416-acre FmHA Tract	Tallahatchie	repair work on existing levees	
Whaley 437-acre FmHA Tract	Marshall	1 levee and 1 WCS	40
TOTALS		29	455

3c. Graze/Mow/Hay

During July 1999, approximately 10 miles of road and utility rights of way were mowed at Dahomey NWR in order to enhance the amount of brood habitat available for wild turkeys. Wild turkeys are abundant on Dahomey NWR. However, 85 percent of the habitat occurring within Dahomey NWR consists of dense bottomland hardwood forest. Therefore, available brood habitat for turkey poults is mainly limited to grassy areas occurring adjacently to road and utility rights of ways.

Hatching dates for turkeys in northwest Mississippi are primarily during May and June. During the first eight weeks turkey poults need extensive short grass areas where they

than can forage for insects. Excellent brood habitat for turkey poults consists of dense herbaceous vegetation that is between 12 to 28 inches. In order to avoid destroying nests of ground nesting birds, such as wild turkeys, the MWMD does not mow during the spring and early summer. By July, when turkeys need brood habitat, the herbaceous vegetation along road and utility rights of ways are usually three to six feet in height. Large areas along roads occurring on Dahomey are infested with almost homogenous stands of Johnson grass. By July, Johnson grass can reach heights of six to ten feet. Therefore, if these areas are not mowed, they do not provide good turkey brood habitat.

Strips that are approximately 100 feet wide are mowed down the middle of rights of ways that are completely vegetated. The edges of gravel roads are also mowed. By doing this, a border of short and tall grass habitat is maintained along extensive wooded areas. This type of mowing produces excellent wild turkey brood habitat. Its effectiveness can be verified by simply driving or walking along rights of ways during July-September and witnessing the large number of turkey broods foraging in these areas.

3d. Farming

Since 1998, 675 acres of cooperatively farmed fields have been planted with hardwood seedlings at the Bear Lake Unit of Tallahatchie NWR (Figure 13). An 85-acre cooperatively farmed field at Dahomey NWR was converted to a moist soil unit during summer 1999. This year 25% of the Bear and Black Bayou Units of Tallahatchie NWR were farmed. Ten percent of Dahomey NWR was farmed. Table 9 identifies the crops and acreage farmed on these two refuges.

From 1998 to 1999, the amount of cooperative farmed lands occurring on Tallahatchie and Dahomey NWRs decreased by 23% and 1%, respectively. The MWMD intends to continue to incrementally reduce the amount of farmed lands occurring on these refuges. In the next 4-5 years all existing cooperative farmed lands should be eliminated from these refuges. Non-irrigated acreage will continue to be reforested or managed for old field habitat. Several fields where wells and pumps are in place will be converted to moist soil impoundments. Being encompassed by thousands of acres of agricultural fields, there is no biological reason for the Service to manage crop fields on these refuges.

Until the cooperative farm program is eliminated, the Service will continue to either require farmers to leave 25% of all crops planted or require them to perform work in the fields to enhance wildlife values. For example, farmers have been reestablishing levees in rice fields and then flooding them during the winter for waterfowl. Thousands of waterfowl can be seen in these fields during winter months. During November through December last year, more than 5,000 ducks (primarily mallards) utilized a 100-acre rice field on daily basis at Dahomey NWR that was flooded by a cooperative farmer.

**Bear Lake Unit of
Tallahatchie National Wildlife Refuge
Grenada and Tallahatchie Counties, Mississippi**

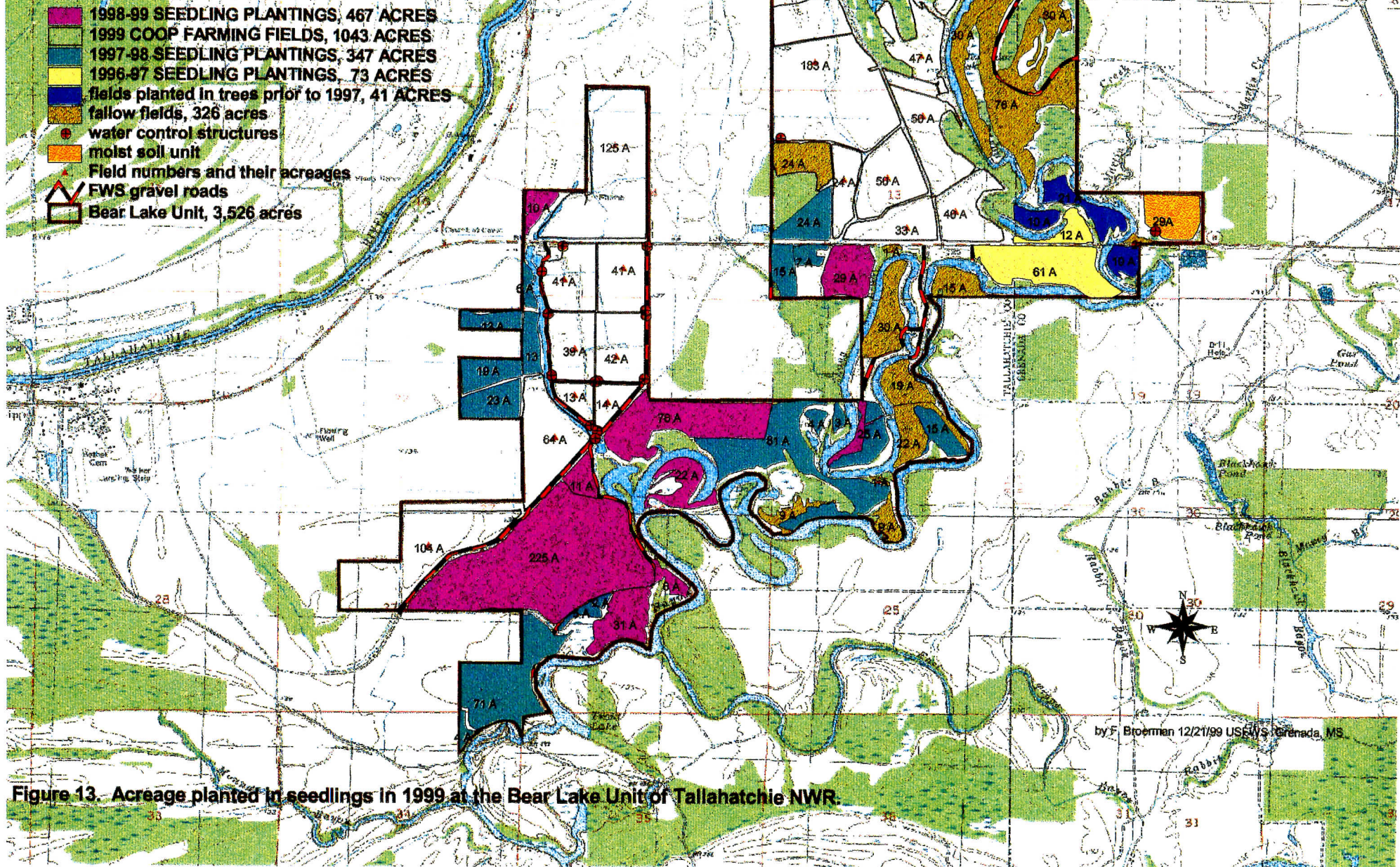


Figure 13. Acreage planted in seedlings in 1999 at the Bear Lake Unit of Tallahatchie NWR.

Table 9. A summary of MWMD's 1999 coop farming program.

Coop Farmer or Refuge	acres in rice	acres in corn	acres in milo	acres in sunflower	acres in soybeans	Refuge Share
Clemons	292				100	winter pumping of rice fields.
Herbison	176	119		1	293	100% of the corn and sunflowers. Construction of a levee in an 85-acre field converted to a moist soil unit.
Dahomey NWR totals (981 acres farmed)	468	119		1	393	
Allison	294				189	Cash lease. 100% will be taken out of production in the year 2000.
Strider	227	64			245.5	100% of the corn and sunflowers and 13% of soybeans.
Bear Lake Unit of Tallahatchie NWR totals (1,028.5 acres farmed)	521	64			443.5	
Rottenberry					187	25% of the beans.
Turner			294		42	20% of the beans and harrow work in additional field.
Black Bayou Unit of Tallahatchie NWR totals (523 acres farmed)			294		229	

3e. Forest cutting

Nothing to report.

3f. Prescribed burning

The MWMD Fire Management Plan (FMP) was approved by the Regional Office on March 30, 1999. Since the approval of the FMP, five MWMD employees have completed basic fire fighting (S-130) and basic fire behavior (S-190) training. These additional firefighters bring MWMD's total number of firefighters to eight.

Personal protective equipment was purchased for all employees participating in the fire management program. The MWMD's fire cache was stocked with various hand tools, hose fittings, and two new chainsaws. Also, MWMD's type 6 engine was refurbished and is now operational. The engine is ready to be used on prescribed fires or to respond to wildfire emergencies.

On two occasions early last spring, several MWMD fire management crew members traveled to Noxubee NWR to assist with prescribed burning activities. On October 26, 1999, the MWMD fire crew conducted a prescribed burn on its 557-acre Walker Tract (Photo 14). The area is managed for migratory waterfowl by manipulating water levels within levees encompassing this area. The Walker tract became so densely vegetated with black willows that moist soil management activities could not be implemented. In order to reduce black willows, herbicide was aerially applied to the Walker Tract during the fall of 1998. The area was burned this year to remove dead vegetation and promote establishment of desirable moist soil plants. Vegetative response to burning activities is being monitored (Figure 14). Assistance with this effort was provided by the Mississippi Sandhill Crane NWR fire crew. Sincere appreciation is extended to Tony Wilder (Fire Management Officer) and his staff for help and guidance with this burn.



Photo 14. During October 1999, the MWMD fire crew burned the 557 acre Walker Tract in order to promote establishment of moist soil vegetation beneficial for waterfowl. Photo by Fred Broerman.

Fire Management Officer Jeffrey Lee is in the process of planning prescribed burns for next year in old field habitat occurring on Tallahatchie and Dahomey NWRs. Additionally, the MWMD intends to gain more experience in conducting prescribed burns by assisting Noxubee and Mississippi Sandhill Crane NWRs with some of their burning activities during the year 2000.

Figure 14. Photos taken at permanently marked plots show vegetational series at the Walker Tract, Tallahatchie NWR, prior to habitat amelioration, October 1998 (top photos), after aerial application of Accord, May 1999 (middle photos), and after this year's prescribed burn, October 1999 (bottom photos). Photos and figure by Ramsey Russell.



3g. Control pest plants

At Dahomey NWR approximately three miles of interior dirt roads and their rights of ways are infested with dense stands of Johnson grass, which provides very limited values for wildlife. It is native to Asia and was introduced into North America around the turn of the century. During the past, Johnson grass was widely planted within disturbed areas for soil stabilization purposes. It is very common along roadsides in the Mississippi Delta and readily pioneers in agriculture fields and other disturbed areas. It is probably the most common invasive weed occurring in the Delta. The dirt roads within Dahomey NWR that are infested with almost homogenous stands of Johnson grass run along streams that were channelized in the past. It is likely that when these streams were channelized the spoil deposited along them was seeded with Johnson grass.

In an effort to reduce Johnson grass and promote the establishment of vegetation more beneficial for wildlife, dense stands of it were chemically treated at Dahomey NWR during July-August 1999. Biological Science Technician Harrigan and Coop Student Stewart mowed approximately five acres of dense Johnson grass stands occurring along northern dirt roads. After mowing, these areas were sprayed with Roundup herbicide. During September 1999, these areas were then disced and planted with clover, rye grass, and wheat. Johnson grass did not become reestablished within the areas treated during the fall of 1999. Treated areas will be monitored next spring for regrowth of Johnson grass. If this year's treatment produces satisfactory results, more areas containing dense stands of Johnson grass will be treated in the same manner during the year 2000 and replicated until dense stands occurring along Dahomey's dirt roads are replaced with native vegetation.

4

Fish and Wildlife Management

4a. Bird banding

Nothing to report

4b. Disease monitoring and treatment

Nothing to report.

4c. Reintroductions

Nothing to report.

4d. Provide nest structures

Between February 25 and March 26 1999 nearly all the wood duck boxes on the Bear Lake Unit of Tallahatchie NWR (19 boxes), the Black Bayou Unit of Tallahatchie NWR (6 boxes), Dahomey

NWR (5), and six FmHA properties (15 boxes) were cleaned out for the 1999 spring/summer nesting season. Only two boxes during this period contained wood duck nests. One box contained a hooded merganser nest, two housed flying squirrels, and two others were occupied by eastern screech owls (Photo 15).

During March 1999, 11 more wood duck boxes were installed at Dahomey NWR, bringing the total to 16 on the Refuge. All these boxes were checked and cleaned out during Fall 1999. Fifty percent these boxes were used for nesting by wood ducks during



Photo 15. During February 1999, a pair of screech owls were found occupying a wood nest box.. Photo by Fred Broerman.

the spring and summer. The MWMD intends to install 18 more wood duck nest boxes on Dahomey during February 2000.

4e. Predator and exotic control

Beavers and nutria are abundant on most MWMD properties. Their presence requires ongoing repair work and maintenance on levees and WCS. Beavers plug up WCS, while nutria burrow through levees. Unplugging structures is difficult, but can be done with a lot of muscle and sweat. Nutria burrows destroy the integrity of levees which make mowing, and other vehicle travel on levees dangerous.

Out of all the properties managed by the MWMD, beavers are most prevalent on Dahomey NWR. Since retaining ownership of Dahomey NWR (1993), the MWMD has removed beavers in limited numbers from the refuge. According to information provided by members of the hunting club that utilized refuge lands prior to Service ownership, 1988 was the last time they removed beavers from the area. Therefore, the beaver population on Dahomey is substantial. Beavers are especially abundant within cypress/tupelo sloughs and streams occurring within bottomland hardwood forest habitat located on the southern portion of the refuge. There are at least three active beaver lodges located on every waterbody within this area. One slough that encompasses 55 acres is known to contain six lodges.

Evidence of beaver activities can be seen within all streams and sloughs occurring on the southern portion of Dahomey NWR. Every stream contains a series of dams and trees have been either cut or girdled by beavers (Photo 16) within large areas of forested habitat located adjacent to waterbodies. The dams cause extensive flooding of bottomland hardwood forest throughout the year. Water held on forested habitat by beaver dams during the growing season has resulted in large areas



Photo 16. Cutting and girdling of trees by beavers along with extensive flooding during the growing season due to dams has resulted in the loss of approximately 300 acres of bottomland hardwood forest on Dahomey NWR. Photo by Brett Wehrle.

of dead timber on Dahomey NWR. Based on analysis of aerial photography, the MWMD estimates that approximately 300 acres, or 4%, of the bottomland hardwood habitat on Dahomey NWR has been killed by beavers.

These areas of dead timber provide habitat for numerous wildlife species, such as river otter, raccoon, waterfowl, wading birds, woodpeckers, and many other species. For example, six different species of woodpeckers can be seen within one 66-acre area of dead timber at Dahomey NWR. However, with no natural predators or human threats the beaver population at Dahomey appears to be increasing annually. Consequently, the amount of dead timber seems to be also increasing. The MWMD has become concerned about the apparent increase in the amount of dead timber on Dahomey NWR due to beavers. The wildlife values of the existing acreage of living bottomland hardwood habitat on Dahomey may be compromised if beaver damage continues to expand.

During the past seven years, the MWMD has utilized explosives to remove beaver dams and water from areas of bottomland hardwoods flooded during the growing season. Removal of beaver dams with explosives has not always produced satisfactory results. Beavers normally have the dams plugged and holding water again within 12-24 hours after explosives are used on them. Due to wet conditions and general inaccessibility of most beaver dams, heavy equipment cannot be utilized effectively to remove most dams. Hand clearing is labor intensive and has to be implemented almost on a daily basis.

In an effort to reduce the loss of forested habitat at Dahomey NWR, beavers were trapped from sloughs and streams on the southern portion of the refuge during February-March 1999 (Photo 17). Refuge Manager Wehrle, Biological Science Technician Harrigan, and Volunteer Danny Moss hand-cleared openings in dams that were holding water on living timber and then set Conibear 330 beaver traps at the dams. A total of 15 fifteen traps were set at six different localities where beaver dams were holding water on extensive areas of living timber. Traps were checked and openings were maintained three to five times a week. A total of 33 beavers were trapped at Dahomey NWR during February-March 1999.



Photo 17. Volunteer Danny Moss with beavers that he trapped from a dam that holds water on bottomland hardwood forest during the growing season. This dam causes flooding of approximately 122 acres of bottomland hardwood forest habitat. Growing season flooding has resulted in the death of 66 acres of timber within this area. Photo by Brett Wehrle.

At the beginning of the trapping period, maintenance of openings in dams was very laborious. Beavers vigorously repaired openings within their dams, clogging them with mud and copious amounts of woody material. As beavers were removed from dam sites, clearing activities were reduced. However, beavers continuously built new dams downstream of areas being de-watered, making the removal of water difficult. Beaver dam clearing activities had to be implemented by refuge personnel through August in order to keep water from flooding living timber. Due to the abundance of beavers in these areas, the limited amount of beaver trapping employed by refuge personnel did not produce satisfactory results. If the MWMD wants to effectively manage water levels in areas flooded by beavers, more intensive trapping efforts will have to be employed in the future.

5

Coordination Activities

5a. Interagency coordination

The NRCS selected MWMD's personnel to carry out construction work, plant trees, and implement site preparation activities on ten WRP contracts during 1999 (Photo 18). Projects were located in five counties in northwest Mississippi. Through our activities with these projects, we restored 154 acres of wetlands, completed site preparation work (mowing) on 81.8 acres, and planted seedling on 341 acres (Table 10).



Photo 18. Equipment Operator Jimmy Perry builds a large levee at the Gritman WRP project site. During 1999, MWMD personnel implemented activities on ten different WRPs, which resulted in wetland restoration and habitat enhancement of 577 acres. Photo by Fred Broerman.

Project Leader Gárd and Wildlife Biologist Broerman took part in a WRP tour of northwest Mississippi on November 18. The tour had 35 participants including Bob

Misso (National WRP Coordinator out of Washington, D.C.) and biologists from the Service, DU, Delta Wildlife Inc., Wildlife Mississippi, along with several NRCS technical specialists and District Conservationists. Misso emphasized that permanent wetlands, which provide summer wetland habitat as well as winter waterfowl habitat, should become a more prominent part of WRP contracts. The tour included stops at two WRP sites where the MWMD's Equipment Operators had done construction work to restore wetlands. The informal and open dialog of the tour encouraged sharing new ideas and insights that will make Mississippi's WRP work better in future years.

Forester Russell, Wildlife Biologist Broerman, and Refuge Manager Wehrle met with Paul Hamel of the U.S. Forest Service at Dahomey NWR on May 18. Hamel conducted a field inspection of the habitat conditions of the bottomland hardwood forest on Dahomey NWR. Based on his observations, he provided recommendations for surveys and possible timber management activities for neotropical migratory passerines.

Table 10. Summary of Wetland Reserve Program (WRP) work completed by MWMD in 1999

WRP name	county	estimated acres in hydrology	cubic yards of dirt moved	number of water control structures installed	acres mowed as site prep prior to planting seedlings	acres planted with seedlings	amount charged to NRCS
Edwards	Bolivar					45	\$6,052.50
Pittman Edwards	Bolivar	20	1,401	3			\$7,940.77
Bennie Jones	Bolivar	8	489				\$1,604.53
Odum	Bolivar	85	2,547	8	50		\$18,655.19
Rushing (extension to levee built in 1998)	Bolivar	5	263				\$978.51
Dean	Quitman					143	\$19,233.50
Grittman	Sunflower	28	1,800	1			\$6,506.00
Tollison and Hughes	Sunflower	8	2,670	1	31.8		\$9,677.50
Speirs	Tallahatchie					33	\$4,438.50
Byrd	Tunica					120	\$16,140.00
	TOTALS	154	32,096	13	81.8	341	\$91,227.00

5b. Tribal coordination

Nothing to report.

5c. Private land activities

There are more requests for assistance on private lands projects that come to the station each year than can possibly be completed by MWMD staff. Nearly every week MWMD's Project Leader and Wildlife Biologist receive requests for technical assistance concerning potential private lands' projects. Effort is made to meet with landowners in order to review their potential projects and evaluate them. Many landowners who want assistance expect MWMD to provide technical support immediately. These requests often come at our busiest season when our Equipment Operators and support staff are already stretched to their limit. Some of these landowners lose interest in the Partners Program when they learn it will take six months to a year before their project is reviewed by the Partner's committee.

Despite busy construction and tree planting seasons devoted mostly to projects on refuge lands, FmHA properties, and several WRP contracts, we were able to lend assistance on several private lands projects. These projects are summarized in Table 11.

Table 11. Private lands projects MWMD was involved with during 1999.

Private Lands Projects	County	Acres planted in seedlings	number of water control structures (WCS) and levees built	Estimated acres of moist soil created or that will be seasonally flooded
Ann Whitten CRP	Tallahatchie		1 levee and 1 WCS	10
Deloach CRP	Tallahatchie	102		
Campbell Green Tree Reservoir	Grenada		1	12
Delta Marsh Inc.	Grenada			20
Springdale (ACOE)	Lafayette		provided 1 WCS	45
Dr. Holden	Grenada	21		
Mack Young (Mississippi Partners)	Quitman		provided 2 WCS	40
TOTALS		123		127

5d. Oil and gas activities

Nothing to report.

5e. Cooperative/Friends Organizations

Over the past year, MWMD has had the opportunity to work closely with several private entities. They have been supportive of our efforts to restore habitat, assisted with the creation of a cooperative student work program, donated materials and supplies, and provided assistance with wildlife/habitat surveys. The following is a summary of cooperative efforts that the MWMD was involved in during 1999.

National Wild Turkey Federation

The National Wild Turkey Federation's Superfund Project donated \$3,350.00 to Dahomey NWR. The money was used to purchase a truck-mounted boom sprayer, five gallons of Roundup, and 4,100 pounds of seed (crimson clover, red clover, ryegrass, wheat, and Austrian winter peas). Biological Science Technician Harrigan and Coop Student Stewart planted approximately 20 acres of wildlife food plots along rights of ways and interior roads closed to vehicular access. In addition, the Mississippi Delta Chapter of the Turkey Federation donated a broadcast seeder that can be mounted on a four-wheeler.

Delta State University

Two types of Memorandum of Understandings (MOU) were developed with the Department of Biological Sciences of Delta State University (DSU) for the establishment of a cooperative student work program at Dahomey NWR. These cooperative agreements provide the opportunity for students to work with staff members in all refuge functions and duties. This allows students majoring in natural resource fields to gain valuable field experience in the wildlife biology and refuge management fields.

The first type of MOU provides each student a \$50 per week stipend and any supplies or materials necessary for the student to perform work tasks and duties. DSU also places them on work study status and they accrue college credits while working at Dahomey NWR. The second type of MOU allows the student to place a small trailer at the refuge headquarters, be provided with electricity and water, and any supplies or materials necessary for the student to perform work tasks and duties.

Harry Stewart, a wildlife law enforcement major at DSU, is our first Coop student under this agreement. Stewart reported for work in June and plans to work with Dahomey's staff during his tenure at DSU. Stewart has been instrumental in the completion of several projects on the refuge. He has worked diligently in assisting Biological Science Technician Harrigan with clearing 15 miles of walking trails, planting 20 acres of wildlife

food plots, mowing, and maintaining wood duck boxes. Stewart also assists refuge personnel with wildlife surveys, operation of check stations, tree planting, water level management, habitat management, public outreach activities, and data base management activities. Furthermore, he performs routine maintenance activities (e.g., carpentry work, servicing vehicles, equipment maintenance, etc.). Since Dahomey NWR is understaffed (i.e., only two full-time employees for an almost 10,000 acre refuge), Stewart's assistance with basic operation and maintenance activities has been especially important .

Tri-state Delta

Tri-state Delta seed company in Cleveland, Mississippi donated 10,000 pounds of rice to Dahomey NWR. Refuge Manager Wehrle and Equipment Operator Brasher planted the rice in a new 85-acre moist soil impoundment. The impoundment was flooded this winter for waterfowl and other waterbirds.

Shreveport Green

Shreveport Green donated 110 potted, 4-6 feet tall trees to Dahomey NWR. Refuge Manager Wehrle and Biological Science Technician Harrigan hand planted nuttall oak, willow oak, water oak, and sycamore trees along the western boundary of a moist soil impoundment.

MDOT

In July, Refuge Manager Barkley and Forester Russel accompanied members of the MDOT during a field inspection of their mitigation banks located at Dahomey and Tallahatchie NWRs.

The Nature Conservancy

Refuge Manager Wehrle, Wildlife Biologist Broerman, and Forester Russell met with Susan Carr of TNC's Baton Rouge, Louisiana office on May 13 and 14, 1999. Carr is a Stewardship Ecologist that is conducting an assessment of vegetative conditions of public lands in the lower MAV. The data collected will be used for eco-region planning efforts associated with the MAV.

6

Resource Protection

6a. Law enforcement

Refuge Operational Specialist Lee and Refuge Manager Wehrle attended the Federal Law Enforcement Training Center's Land Management Training Program during July-October 1999. Both received law enforcement credentials and are functioning as new Refuge Officers for the MWMD. They will be attending the two-week Refuge Officers Basic course in May 2000. With the constantly increasing land-base managed by the MWMD and the scattered locations of FmHA properties their assistance with law enforcement matters is needed. Vandalism, theft, fire, and illegal hunting occur frequently on FmHA properties. Evidence of these and other violations can be seen on each new visit to some sites. Easement violations are numerous and persistent. MWMD Refuge Officers again issued more than 100 Notices of Violations (NOVs) this year (Table 12).

One of our more prominent cases this year involved a Federal Park Ranger with the U.S. Army Corps of Engineers. He was found guilty in U.S. District Court for: (1) hunting over bait on a NWR, (2) hunting on a NWR without the required permit, (3) hunting on a NWR without the required hunter's orange, and (4) traveling or using any motorized (i.e., he used a 4-wheeler) or other vehicle on a NWR on non-designated routes of travel.

Notices of the Park Ranger's violations were issued following a contact on December 17, 1998 at Dahomey NWR by Refuge Officers Denton and Barkley. It was brought to the U.S. Magistrate's attention that the Park Ranger had previously received citations for wildlife violations in two counties and had them dismissed. The Park Ranger plead guilty to all violations. He was fined \$370.00, required to pay a \$20.00 special assessment, sentenced to one year of active, supervised probation with regular reporting to a probation officer, and had his hunting privileges revoked worldwide for two years. The Judge made certain that Mississippi Department of Wildlife, Fisheries, and Parks officers and Federal Special Agents in Mississippi were advised that his hunting privileges were revoked.

Table 12. Law enforcement violations reported by the Mississippi Wetland Management District during 1999.

CODE	VIOLATION DESCRIPTION	NUMBER OF VIOLATIONS
20.21(b)	Take with Shotgun Capable of Holding More Than Three Shells.	6
20.21(l)	Take Migratory game Birds with the Aid of Bait.	30
20.21(j)	Take migratory waterfowl while possessing toxic or lead shot.	2
20.24	Take Migratory Game Birds in Excess of the Daily Bag Limit.	6
20.36	Violation of tagging requirements for migratory game birds.	3
20.37	Custody of untagged migratory game birds of another.	3
20.72	Take Migratory Game Birds without a State License.	4
20.72	Take Migratory Game Birds without a State Stamp.	1
26.21(a)	Trespass by person on NWR.	6
26.21(b)	Permitting an unconfined domestic animal to enter on a National Wildlife Refuge.	3
26.22 (b)	Entering a National Wildlife Refuge without the required Refuge Permit.	5
27.21	Take any Animal or Plant without Authorization.	1
27.31	Travel in or use of any motorized, or other vehicle, on a National Wildlife Refuge on other than designated routes of travel.	6
32.2 (a)	Hunting on NWR without the Required State License.	2
32.2 (d)	Hunting on a National Wildlife Refuge without the required hunter orange.	5
32.2 (d)	Hunting from a Public Road on a NWR.	1
32.2 (e)	Transporting an uncased and loaded firearm on a National Wildlife Refuge.	26
32.2 (h)	Hunting over bait on a National Wildlife Refuge.	1
16 USC 718a	Hunt Migratory Waterfowl without a Federal Duck Stamp.	3
	Total Violations	114

MWMD Refuge Officers continued with their investigation that began in 1999 involving squatters and junk removal on the 204-acre Lindsey FmHA fee title property in Sunflower County, Mississippi. This case has been forwarded to the solicitor's office and is awaiting prosecution. The MWMD intends to get the squatters evicted and the property cleaned up in accordance with Mississippi Department of Environmental Quality's standards.

On January 24, 1998, Refuge Officer Barkley, Special Agent Pilgreen, and State Conservation Officer (CO) Waggoner conducted a field compliance check of duck hunters in Sunflower County, Mississippi. The hunters had one hen mallard too many, and believed it or not, they flipped a coin to see who would get the ticket. Three of the four hunters had previous migratory bird convictions and believed that if they got another conviction they would have their hunting privileges revoked by the court. Information for the hunter to be prosecuted was run through the Law Enforcement Management Information System (LEMIS). LEMIS confirmed that he had previously received a Notice of Violation (NOV).

The suspect had a resident Mississippi hunting license that identified his home address and phone number as being in Bolivar County, Mississippi. The suspect's driver's license was not checked because he was riding in a vehicle with a Mississippi tag and demonstrated knowledge of a local resident. The next day, Refuge Officer Barkley called the phone number identified on the suspect's resident hunting license. The suspect's mother answered the phone and confirmed that he did live with her in Bolivar County, Mississippi.

Sometime later, CO Waggoner was talking to the local Sunflower County, Mississippi CO and happened to mention the name of the loser of the coin toss. The local CO knew this person and said that he had resided in Louisiana for several years. CO Waggoner passed this information onto Refuge Officer Barkley.

In a subsequent follow up, the Mississippi State License Section revealed that for the past three years, the suspect had purchased a hunting license with money orders using his mother's Bolivar County address and his social security number for a driver's license number. However, a Mississippi Criminal History check revealed that the suspect had surrendered his Mississippi driver's license to the state of Louisiana and his address was identified as being in Monroe, Louisiana.

The suspect was then contacted at his home in Louisiana. He admitted that he no longer lived in Mississippi. Therefore, the NOV that was written regarding his shooting over the limit was amended to include failure to obtain the required state hunting license. Ultimately, the suspect paid fines totaling \$750.00 for these violations. Also, all case information was provided to the Mississippi Department of Wildlife, Fisheries, and Parks for review because making a false statement to obtain a license is a state offense, punishable by a fine \$2,000.0 and/or imprisonment for term not to exceed one year.

MWMD refuge officers coordinated with Mississippi Department of Wildlife, Fisheries, and Parks local COs for joint efforts during the 1999 mourning dove season. A total of 54 citations were issued, which included violations for hunting over baited fields, not possessing a license, shooting an unplugged gun, taking over the daily bag limit, and violating tagging requirements (Photo 19). Refuge Officer Denton documented three baited fields that yielded the majority of the violations.



Photo 19. These doves (348), were seized opening day of the 1999 season by MWMD refuge officers. Violations associated with this seizure included hunting over three baited fields and exceeding the bag limit. Photo by Wayne Denton.

Refuge Officer Barkley spent three days in Titusville, Florida, participating in one of the manatee details coordinated by the Service's Division of Law Enforcement. The detail consisted of five Special Agents and Refuge Officers working out of four boats. Approximately 100 violations were documented during the three-day detail. Most of the violations were associated with boaters going too fast through manatee protection zones. The heat was excruciating, however, Officer Barkley enjoyed this detail and even got to see his first manatee.

Refuge Officer Denton completed the two week firearms instructors' training course at the Federal Law Enforcement Training Center in Glynco, Georgia. He also completed the advanced firearms training course that was conducted in Des Moines, Iowa during 1999.

6b. Wildfire preparedness

The MWMD currently has six arduous duty wildland firefighters who can respond to wildfire emergencies occurring on MWMD properties. The number of wildland firefighters should increase to eight during the early part of the year 2000. Also, these personnel are available for regional and national wildfire emergency situations.

MWMD's type 6 engine was refurbished and is now operational. The engine is outfitted with various hand tools, hoses, and hose fittings. The engine is ready to be used for responding to wildfire emergencies. Also, fire lanes are maintained on an annual basis around the perimeter of FmHA properties using tractor/mower and dozer/plow.

Members of the MWMD wildfire response team were given memberships to a local gym to help maintain their physical fitness efficiency. Annual pack tests will be administered in January 2000.

6c. Manage permits and economic uses

Nothing to report.

6d. Contaminant investigation and cleanup

Refuge Officer Denton investigated the illegal dumping of approximately 1,000 gallons of diesel fuel in a wetland adjacent to Service's Starr FmHA fee title property in Quitman County, Mississippi (Photo 20). A local gas company was hired by the landowners to remove a diesel tank from the property. When they could not load the tank onto their



Photo 20. Refuge Officer Denton and NRCS District Conservationist Larry Pride investigate the illegal dumping of approximately 1,000 gallons of diesel in a wetland adjacent to Service property. Photo by Ramsey Russell

lowboy trailer due to its weight, they opened the valves and dumped the fuel. Refuge Officer Denton located the tank by following the trail of diesel being spilled on the highway and in its ditches by the gas company while in route to their office. Within four hours, Ferguson Harbour, a hazardous spill company from Memphis, Tennessee, was dispatched to clean up the area to Department of Environmental Quality Standards. The clean up area includes three acres at the dump site and two roadside ditches where several hundred gallons of diesel were spilled in route to the gas company. The Department of Environmental Quality is in the process of filing charges against the gas company.

6e. Manage water rights

Nothing to report.

6f. Manage cultural resource

Nothing to report.

6g. Federal Facility Compliance Act

Nothing to report.

6h. Land acquisition

After several years of waiting, the FmHA in Quitman County, Mississippi transferred fee title to the 245-acre Butler property. When FmHA provided us with the deed, it was for only 205 acres. Therefore, the deed had to be modified in their Jackson, Mississippi office. This property is adjacent to a 60-acre fee title property that we acquired several years ago and contains a significant amount of cypress/tupelo habitat.

The FmHA also transferred six Conservation Easements located in Union County, Mississippi to the Service. There are a total of 113 acres in these Conservation Easements. These properties are all within a two-hour drive from MWMD's Grenada office. Except for one of these easements, which is 76 acres, all are too small to effectively manage.

Project Leader Gard met with the Service's newly hired Area 1 reality specialist and provided him with a prioritized list of known willing sellers of property within the acquisition boundaries of Dahomey NWR and both Units of Tallahatchie NWR. Additionally, discussions were held emphasizing that in the past, after notifying Regional Office's Division of Reality of properties known to be for sale, these properties were sold in the private sector before the Service could have them appraised. The MWMD will continue to notify the Division Reality of priority properties known to be available from willing sellers.

Representatives of refuges in the Mississippi Focus Group area met in Vicksburg, Mississippi to discuss proposals for new NWRs and changes to the acquisition boundaries of existing refuges. The MWMD proposed expanding the boundaries of both Units of Tallahatchie NWR in order to conform to the Migratory Bird Conservation Zones that were previously established by Partners in Flight. Additionally, the MWMD proposed a new NWR in Mississippi centered around the CORPs 4,300 acre Askew Area. There is no Service presence in this part of Mississippi and it is very likely that the CORPs would license management of Askew to the Service. Finally, the MWMD proposed establishing another new refuge in the headwaters of the Skuna/Yalobusha Rivers, upstream from the

CORP's Grenada Reservoir. This new NWR would emphasize aquatics/water quality and be consistent with the Service's ten year plan for the lower MAV.

The planning documents for expanding the acquisition boundary for Dahomey NWR were approved by the Service's Washington Office during the summer of 1999. Currently, the Environmental Assessment for this expansion plan is undergoing final review by the Regional Office. This plan provides for acquisition of 12,000 additional acres. Acquisition of these lands will result in connection of Dahomey NWR to the mainline Mississippi River levee.

6i. Wilderness and natural areas

Nothing to report.

6j. Threats and conflicts

Nothing to report.

8

Public Education and Recreation

8a. Provide visitor services

- The spring 1999 turkey hunt at Dahomey NWR was again a success. Hunters harvested six adult gobblers during the season.
- Dahomey and Tallahatchie NWRs held a youth gun deer hunt during November 13-14, 1999, which coincided with the youth hunt set by the Mississippi Department of Wildlife, Fisheries, and Parks. Participation was very low this year. Only 15 youths participated in these hunts. No deer were harvested.
- Public participation during the Dahomey and Tallahatchie NWR's archery deer seasons increased from last year. Two bucks and eight does were harvested on Dahomey NWR, while none were taken on Tallahatchie.
- The muzzleloader deer season is an event that is growing in popularity at both Tallahatchie and Dahomey NWRs. During the first Saturday of the season, 83 hunters were present at Dahomey NWR. For both Refuges, there were 25 bucks and 9 does harvested during the 1999 fourteen-day season.
- The three-day gun hunt at Dahomey was held December 16-18, 1999. The three days sparked great interest. For the three-day hunt a total of 5 bucks and 7 does were taken.
- The 1999-2000 waterfowl season will be only the second year waterfowl hunting has been permitted on Dahomey and the Bear Lake Unit of Tallahatchie. Waterfowl hunting was allowed on Wednesdays, Saturdays, and Sundays from sunrise until noon.



Photo 21. This gobbler was taken by Trent LaMastus during Dahomey's 1999 spring turkey season. It weighed 18 lbs and had a 9 1/4 inch beard. Photo by Brett Wehrle.

Increased quality and quantity of waterfowl habitat at Dahomey and Tallahatchie NWRs has attracted large numbers of ducks and duck hunters. As more people find out about the waterfowl hunting opportunities at these refuges, the amount of public use and interest will likely increase. During the 1998-99 season a total of 252 ducks were taken. Ninety-six percent of the ducks harvested were mallards and wood ducks.

- Fee title FmHA properties in Bolivar, Marshall, Quitman, and Sunflower Counties were opened to small game hunting for the second consecutive year. Rabbit hunters have reported excellent success on these areas. The properties total 2,852 acres in size and provide exceptional small game hunting opportunities for the public.
- Hunters participated heavily in squirrel hunting opportunities available at Dahomey NWR during 1999. Hunters reported harvesting 111 squirrels. This represented more than a ten-fold increase in the total amount harvested during 1998.

8b. Outreach

During 1999, MWMD staff have had the opportunity to participate in a variety of outreach activities. Outreach activities that MWMD participated in during 1999 are identified below.

- In January, Refuge Manager Wehrle gave a presentation to a Cleveland, Mississippi Boy Scout troop concerning endangered species, NWR system, and wildlife conservation.
- In February, Refuge Manager Wehrle participated in the filming of an episode for a television program called "Farm Week." The episode covered private lands conservation activities in the Mississippi River Delta. Local farmers and DU biologists also made guest appearances on the program..
- Refuge Operation Specialist Lee and Wildlife Biologist Broerman served as judges for the Grenada High School Science Fair during February.
- On April 10, Biological Science Technician Harrigan gave a presentation to a Boy Scout Troop from Cleveland, Mississippi. She provided them with information about the type of trees and plants that are found on Dahomey NWR. They received instruction on tree identification and wildlife use of plants. They also learned about the benefits of wildfires and prescribed burns. The instruction that the Boy Scouts received fulfilled the requirements necessary for obtaining their forestry merit badge.

- During the summer, MWMD Equipment Operator Hal Jones constructed an artificial river at the Grenada, Mississippi Middle School (Photo 22). This river will be used for teaching students about aquatic ecosystems and is part of an environmental educational center that was built at the school.
- In August, Refuge Officer Denton assisted with the operation of the Central Gulf Ecosystem Team booth at the annual Wildlife Extravaganza in Jackson, Mississippi.
- Wildlife Biologist Broerman was interviewed in August by Keith McKnight and Harvey Huffstatler from DU about the MWMD shorebird management efforts at the old catfish ponds on the Black Bayou Unit of Tallahatchie NWR. McNight is writing an article for the "Birding" magazine, which will highlight shorebird management efforts in North America.
- On October 7, Wildlife Biologist Broerman conducted a tour of the old catfish ponds on the Black Bayou Unit Of Tallahatchie NWR, for eighteen undergraduate and graduate students taking a Waterfowl Ecology and Management class taught by Dr. Rick Kaminski at Mississippi State University. The tour highlighted management strategies for shorebirds in the summer months and for waterfowl in the winter months, and the compatibility of different management techniques.
- On October 9, Biological Science Technician Harrigan and Coop Student Stewart attended the Science Day Fair at the University of Mississippi Biological Field Station in Oxford, Mississippi. A Service display with mounted wildlife specimens and brochures was set up. Harrigan and Stewart answered questions regarding wildlife and the NWR system. The fair was attended by more than 150 children and adults. The majority of the children were in scout troops.



Creating an ecosystem...

Hal Jones, (front left) of the United States Department of Fish and Wildlife shows Grenada Middle School students Matthew Long and Cressen Hughes, Alexia Turner, and D.D. White how the laser plane receiver works with the Laser Plane. The instrument is being used to help create the river which will be part of the Choctaw Village and Ecosystem Teaching Center to be created at Grenada Middle School.

Photo 22. Equipment Operator Hal Jones takes some time-off from constructing an artificial river in order to teach Grenada Middle Students about using a laser plane level for surveying. Photo from The Daily-Star newspaper, Grenada, Mississippi.

9

Planning and Administration

9a. Comprehensive management planning

Nothing to Report

9b. General administration

Funding - 1998

Program	Accounting Code	Allocated
Refuge Operations	1261	\$388,500
MMS	1262	\$672,200
Migratory Bird	1230	\$10,000
Fire	9252	\$2,000
Private Lands	1121	\$333,000
TOTAL		\$1,405,700

Personnel

Personnel of the MWMD are identified in Table 13 and Photo 23. There were no personnel changes at the MWMD during 1999.

Table 13. Personnel list for MWMD in 1999.

<u>Permanent Full Time Employees</u>	<u>Grade</u>	<u>EOD Date</u>	<u>Departure Date</u>
1. Stephen W. Gard Project Leader	GS-13	10/08/89	
2. Robert Barkley Deputy Project Leader	GS-12	05/19/92	
3. Fred Broerman Wildlife Biologist	GS-11	01/07/96	
4. Wayne Denton Refuge Officer	GS-8	05/28/95	
5. Kimberly Harrigan Biological Science Technician	GS-7	09/15/98	
6. Jeffery Lee Refuge Operations Specialist	GS-9	09/27/98	
7. Ramsey Russell Administrative Forester	GS-11	07/20/98	
8. Bobbie Willis Office Assistant	GS-7	09/28/98	
9. Brett Wehrle Refuge Manager	GS-11	06/08/98	
10. Billy Brasher Equipment Operator	WL-8	04/21/91	
11. William "Hal" Jones Equipment Operator	WG-8	08/08/94	
12. Jimmy Perry Equipment Operator	WG-8	07/10/95	
13. Don Roby Equipment Operator	WG-8	08/03/98	



Photo 23. Back Row: (left to right) Billy Brasher, Ramsey Russell, Jeffrey Lee, Don Roby, Jimmy Perry, and Fred Broerman. Middle Row: William "Hal" Jones, Brett Wehrle, Wayne Denton, and Robert Barkley. Front Row: Kim Harrigan, Stephen Gard, and Bobbie Willis.

Volunteers

Gene and Shannon Knight each volunteered more than 90 hours, working mostly on weekends. They conducted shorebird counts of the old catfish ponds at the Black Bayou Unit of Tallahatchie NWR. They are both skilled birdwatchers and their efforts nicely complimented data collected by Wildlife Biologist Broerman.

Danny Moss volunteered more than 250 hours at Dahomey NWR. Moss assisted with wildlife surveys, operation of check stations, beaver trapping, tree planting, mowing, and general maintenance duties. Moss received a Master's Degree in Biology from Delta State University in May 1999 and is now working as the Refuge Operations Specialist at Cache River NWR.

Work Programs

The 1999 Youth Conservation Corps (YCC) program at the MWMD went extremely well. YCC workers employed by the MWMD during summer 1999 included Leigh Ann McCalop, Scott Forrest, Adam Milner, and Arthur Hitchcock.

McCalop assisted with clerical duties. This included answering the phone, rehabilitating the MWMD's filing system, and assisting our office assistant with her daily duties. She also participated in several outings with the MWMD's staff which helped to broaden her knowledge of the environment.

Forrest, Milner, and Hitchcock assisted with daily refuge maintenance, general construction, painting, boundary posting, and trail maintenance. They were instrumental in the completion of trail clearing at Dahomey NWR. They also learned about the MWMD's wood duck nest program by assisting with data collection and box rehabilitation efforts. They were able to observe and learn about wildlife and their habitats during implementation of their duties.

The YCCs were a significant asset to MWMD's operations this past summer. They had wonderful personalities and superior attitudes. With their assistance, we were able to accomplish numerous tasks that otherwise would not have been done.

Equipment and Facilities

The following are significant equipment purchases that were made by the MWMD during 1999:

- A 1999 four wheel drive Ford Ranger pick up was purchased to replace a Jeep Cherokee with high mileage. The pickup will be mainly used by Refuge Operational Specialist Lee.
- A 1999 3/4 ton Chevrolet four wheel drive, crew cab pickup was purchased as a replacement for an old high mileage truck utilized by MWMD Equipment Operators.
- A new welder was purchased for use by the MWMD's maintenance crew.
- Three Kawasaki 300 four wheelers were purchased to replace three 1990 Suzuki four wheelers that were worn out.
- Several hand and power tools (i.e., screwdrivers, wrenches, drills, sander, grinder, circular saw, etc.) were purchased for Dahomey NWR. The refuge was only recently staffed (last year) and had no tools.
- Three Dell Pentium computers, two DeskJet printers, and two Hewlett Packard Color LaserJet printers were purchased.

Road rehabilitation continued at Tallahatchie and Dahomey NWRs during 1999. At the Bear Lake Unit of Tallahatchie NWR clay gravel and wash rock was placed on one mile of an existing dirt road. Wash rock was placed on approximately three miles of existing gravel roads at Dahomey NWR. Also, an unimproved dirt road approximately one-half

mile in length was reshaped at Dahomey. Clay gravel will be placed on this road during summer 2000. The MWMD intends to continue to reshape and gravel many of the existing roads on Dahomey and Tallahatchie NWRs that are in poor condition.

The existing gravel boat ramp on Tippo Bayou at the Bear Lake Unit of Tallahatchie NWR was replaced. This boat ramp was too steep and vehicles often could not gain traction necessary to pull boats and trailers out of the bayou. Therefore, MWMD Equipment Operators and a private contractor reduced the slope of boat ramp and then poured a concrete slab (Photo 24).



Photo 24. Equipment Operator Don Roby and private contractor Houston Wright smooth concrete poured on the new boat ramp on Tippo Bayou at the Bear Lake Unit of Tallahatchie NWR. Photo by Fred Broerman.

At Dahomey NWR, Biological Science Technician Harrigan, Coop Student Stewart, and YCCs cleared approximately 15 miles of old jeep trails. These trails will be utilized as walk-in areas for the public and management purposes for refuge personnel. Also, an existing unsafe wooden bridge over Stokes Bayou was replaced with a culvert bridge. Including this project, four unsafe bridges have been replaced at Dahomey during the past four years. Presently, there are no more bridges located on Dahomey NWR that need to be replaced.

Credits

Barkley, Robert: 6h and proofreading

Broerman, Fred: Introduction (part), 1a, 1b, 3a (part), 3b (part), 4a, 4d (part), 5a, 5c, 8b (part), 9b (part), and proofreading

Denton, Wayne: 6a, 6d, and 9b (part)

Gard, Stephen: 9b (part) and proofreading

Harrigan, Kim: 5e, 8a (part), 8b (part), 9b (part), and proofreading

Lee, Jeffrey: 3d (part), 3f, 6b, and 8a (part)

Russell, Ramsey: 1b, 2a, 2c, proofreading, and photo scanning

Wehrle, Brett: Introduction (part), Climate, Highlights, 3a (part), 3b (part), 3c, 3d (part), 3g, 4d (part), 4e, 5e (part), 8a (part), 8b (part), 9b (part), and proofreading



Photo 25. This least bittern was seen on the Black Bayou Unit of Tallahatchie NWR in April 1999. Due to habitat and water level management within moist soil impoundments, the Black Bayou Unit attracts numerous species of waterfowl and wading birds. Photo taken by Fred Broerman.